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TREATMENT OF LEPROSY WITH DIASONE

A PRELIMINARY REPORT

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Recently a number of new derivatives of diamino diphenyl sulfone have been tried in the chemotherapy of experimental animal tuberculosis and more recently of human tuberculosis. One of those agents is diasone, the disodium formaldehyde sulfoxylate derivative of diamino diphenyl sulfone. Callomon[1] has reported that diasone inhibited the progress of experimental tuberculosis in the guinea pig and that it was less toxic than promin. Feldman and associates[2] have corroborated the therapeutic effect of diasone in experimental tuberculosis and found it less toxic than the parent drug diamino diphenyl sulfone. Diasone has been used in human tuberculosis with promising results by Petter and Prenzlau,[3] but their report has not been generally confirmed and the status of diasone therapy of tuberculosis is still under clinical investigation.

In the chemotherapy of leprosy, promin is still being used intravenously at the National Leprosarium with encouraging results. Promin, however, has been found to be too toxic when administered orally to patients with leprosy[4] and, since oral medication is advantageous in such a chronic disease as leprosy, the low toxicity of diasone when given by mouth had a special appeal to the writers.*

Petter and Prenzlau[3] advocated 1 gram of diasone a day as an adequate dose in treating human tuberculosis. They found blood levels ranged between 1.5 mg. and 2 mg. per 100 c. c. with this dose. Upon increasing the dose they found that the blood concentration levels did not increase proportionately, and expressed the opinion that a dose greater than 2 grams a day was not indicated in the treatment of clinical tuberculosis.

TECHNIC OF MEDICATION

In the writers' preliminary study a small group of leprosy patients were started on 1 gram of diasone daily (one 5 grain capsule three times a day). Careful clinical and laboratory examinations were conducted. Urinalyses and hemograms on every patient were done twice a week at first and later at intervals of at least two weeks, and other laboratory tests were carried out when indicated. Within a few days of the inception of treatment, several patients experienced hematuria, so that treatment was necessarily discontinued. Indeed the frequency of hematuria was the chief indication for changing the technic of administration of diasone. It was found that by starting with smaller doses of diasone, 1/3 gram daily, the development of hematuria could be avoided. After the patient had acquired a tolerance for the drug, that is, after one or two weeks, it was found to be safe to increase the dose to 2/3 gram daily. Several weeks later, if no toxic symptoms had developed, the full dose of 1

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*The diasone used in this investigation was supplied by Abbott Laboratories of North Chicago through the courtesy of Dr. George R. Hazel.

gram could be administered.

At present, the maximum dose is 1 gram daily, and this dose is administered only to patients exhibiting no evidence of intolerance after one month or more of clinical and laboratory observation.

TOXIC MANIFESTATION AND REASONS FOR DISCONTINUING TREATMENT

Although diasone was administered to 70 patients altogether, treatment had to be discontinued in 23 of them. Table 1 lists the causes for discontinuance of treatment.

TABLE 1
CAUSES FOR DISCONTINUANCE OF DIASONE TREATMENT

	No. of Cases
Hematuria	6
Gastritis	6
Anemia	4
Dermatitis	3
Iridocyclitis	1
Hypertension	1
Deserting absconding patients	2

Renal Damage: Renal irritation resulting in gross or microscopic hematuria was the cause for interrupting therapy in six patients. This condition developed exclusively during the early stage of the investigation, when the drug was given in initial doses of 1 gram. Since the adoption of new technic of starting all patients on 1/3 gram of diasone daily and increasing to 2/3 gram only after one or two weeks of treatment, no further evidence of renal disfunction has occurred.

Gastritis: Nausea of a mild nature was reported at first by approximately one-fourth of the patients taking diasone. With continuance of treatment, as the patients acquired a tolerance for the drug, nausea decreased or disappeared. Only a few patients complained of severe nausea with anorexia and loss of weight. Vomiting seldom occurred. It was found that, by giving diasone during meals or in conjunction with alkalies, nausea often could be prevented. Some patients experienced instead of nausea an improvement in appetite, gain in weight, and increase in energy. Gastric irritation with nausea and vomiting was the complaint of six patients, in whom treatment was discontinued at their own request.

Hemolytic Anemia: Diasone being an hemolytic agent, anemia developed in the majority of patients early in the course of treatment. The anemia was generally mild and with the development of tolerance was often replaced by an actual increase in erythrocytes and hemoglobin. Even a moderate degree of anemia was usually controllable by the oral administration of iron, liver extract and vitamin B or by Ventrex as adjuvant therapy. The writers have considered a fall in the red blood cells below the level of 3,000,000 as an indication for temporarily discontinuing diasone. Persistent anemia necessitated permanent discontinuance of treatment in four patients.

Table 2 shows the changes which occurred in the erythrocyte counts of the 47 patients who were able to continue treatment for more than three months.

TABLE 2
CHANGES IN ERYTHROCYTE COUNTS DURING TREATMENT

No. of Cases	No change (differences of less than 50,000)	Decreased Counts	Increased Counts
	10.7%	53.2%	36.1%
47	5	25	17

The average decrease in red blood cell counts in individual cases varied from 50,000 to 1,480,000, and the mean of the averages for the 25 patients was 350,000.

The average increase in the red blood cell counts in individual cases varied from 50,000 to 900,000 and the mean of the averages for the 17 patients was 270,000.

Dermatitis: Toxic dermatitis, manifesting itself twice as erythema nodosum and once as erythema multiforme was the reason for discontinuance of treatment in three patients.

One case of iridocyclitis, one case of hypertension, which were merely coincidental, and two patients who deserted account for the other interrupted treatments.

It is interesting to note that all 23 patients in whom treatment was stopped had taken diasone less than three months, too short a period for evaluation of therapeutic results. It is gratifying that, when they are severe enough to demand cessation of treatment, symptoms of intolerance develop early in the course of treatment.

CLINICAL MATERIAL

The above 23 patients eliminated, there were 47 who took treatment for more than three months. These 47 cases form the clinical material upon which this report is based.

TYPE OF DISEASE TREATED

Of the 47 patients under study, 42 were of lepromatous, or mixed, type, four were of the maculo-anesthetic, or neural type, and one was of the tuberculoid type. It is thus evident that patients with the least favorable prognosis formed the bulk of the clinical material under investigation.

Furthermore, of the 42 lepromatous and mixed cases, 25 were far advanced, 14 moderately advanced, and three minimal in extent of the disease.

Approximately four months of treatment with diasone usually was necessary before clinical evidence of improvement was observed. Thereafter, improvement was usually progressive and increased directly with the length of the period of treatment. This is demonstrated in table 3.

TABLE 3

RELATION OF DURATION OF DIASONE THERAPY TO THERAPEUTIC EFFECT

Duration of Therapy	No. of Cases	Improved	Percentage Improved
3 to 6 mo.	16	11	68.7
6 to 12 mo.	26	19	73
12 to 18 mo.	5	5	100
Total	47	35	74.5

Table 4 shows that the percentage of improvement also increased with the size of the daily dose of diasone up to a certain point.

TABLE 4

RELATION OF AVERAGE DAILY DOSE OF DIASONE TO THERAPEUTIC EFFECT

Gram/Day	No. of Cases	Improved	Percentage Improved
0.1 — .19	3	1	33
.2 — .29	6	4	67
.3 — .39	1	1	100
.4 — .49	6	6	100
.5 — .59	12	10	83
.6 — .69	6	5	83
.7 — .79	2	2	100
.8 — .89	9	5	56
.9 —1.00	2	1	50
Total	47	35	74.5

From the above tables it is apparent that the percentage of improvement was in direct proportion to the duration of treatment and to the average daily dose of diasone up to 0.8 gram. In estimating the average daily dose, periodic rest intervals of several days, during which no drug was administered, were taken into consideration. Although the optimal dose of diasone for leprosy has not been established, it is felt that 1 gram a day is the maximum dose which should be administered over an extended period of time. A dose of 2/3 gram daily was tolerated by a larger number of patients than the 1 gram dose and was adequate in most cases as can be judged by the improvement shown in table 4. It is doubtful that doses larger than 1 gram daily would be therapeutically more potent than the smaller doses.

Of the 47 patients in this investigation only three have shown any advance of the disease in spite of treatment with diasone. In two of these patients, who had apparently shown some improvement after six months of treatment, a few small nodules appeared at the site of old ones which had temporarily receded. This development can be considered a progression of the disease during treatment, and these two patients can be classified as having become worse. However, upon continuation of diasone, the new nodules showed evidence of subsiding. Another patient with far-advanced lepromatous leprosy died of progressive leprous laryngitis. She had taken very inadequate treatment because of repeated and prolonged periods of interruption due to a secondary anemia. Two blood transfusions were necessary when the red blood cells reached the low level of 2,500,000. Altogether this patient was able to tolerate only 47 grams of diasone scattered over nine months of treatment—an average of only 0.21 gram daily. The above three cases, 6.5 per cent of those under study, are the only ones in which the disease advanced.

Previous experience in the National Leprosarium indicates that with the type and

stage of leprosy under investigation the frequency and the degree of improvement shown are much greater than might be expected in the absence of treatment with diasone.

Tuberculosis is a frequent and serious complication of leprosy at the National Leprosarium[6]. The development of tuberculosis may be regarded as an additional indication for the institution of promin or diasone therapy. Thus far ten tuberculous patients have been placed on promin or diasone treatment in the hope that both diseases might be favorably influenced by the same drug. In two of them the tuberculous disease advanced during the course of treatment but in the majority of the others an improvement was shown by serial roentgenograms.

Two brief case histories, representative of a large group, will serve to demonstrate further the effects of diasone in leprosy.

CASE REPORTS.

Case 1. Colored female, 30 years of age, had far advanced lepromatous leprosy at onset of diasone treatment. The disease was of five years' duration. Clinical findings were large confluent nodules and infiltration of the face with generalized nodular eruption on arms, forearms, buttocks, thighs and legs, smaller discrete nodules over the chest and evidence of leprous rhinitis. Nasal and skin smears were positive for *M. leprae*. There was some advance in the disease following chaulmoogra oil treatment. Diasone was administered in doses of 2/3 gram daily, totalling 138 grams. In seven months objective improvement was observed (see illustrations), although skin and nasal smears remained positive.

Case No. 1.
Before treatment.

Case No. 1.
After seven months treatment, totalling 138 grams of diasone.

Case No. 1.
Before treatment.

Case No. 1.
After seven months' treatment, totalling 138 grams of diasone.

Case 2. Colored male child, 6 years of age, with moderately advanced lepromatous leprosy of two years' duration. Clinical manifestations were multiple nodules scattered over the face, plaques on the right side of the forehead and the left cheek, infiltration and scattered nodules of the forearms, hands, buttocks, thighs, legs and feet and evidence of leprous rhinitis. No improvement was noted with oral administration of chaulmoogra oil. Skin and nasal smears were always positive for *M. leprae*. Diasone was given in 1/3 gram doses daily and totaled 61 grams. Definite improvement after eight months is shown in the illustrations. Skin smears still positive.

CONCLUSIONS

Diasone is a sulfone drug which can be given orally in the treatment of leprosy

Case No. 2.
Before treatment.

Case No. 2.
After eight months' treatment, totalling 61 grams of diasone.

with relatively mild toxic reactions in most cases.

The average tolerated dose is 2/3 to 1 gram daily given in 5 grain capsules during meals.

Oral medication is preferable in leprosy; hence diasone has an advantage over promin which was found to be too toxic for oral administration in leprosy and is used intravenously at the National Leprosarium.

The objective improvement observed during the diasone treatment of leprosy is encouraging, but further clinical evaluation is necessary before it may be regarded as a leprostatic agent.

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ENDEMIC (MURINE) TYPHUS FEVER IN LOUISIANA

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The purpose of this communication is to bring to the attention of the physicians of Louisiana the fact that endemic (murine) typhus fever has increased in incidence remarkably during the past several years. We have recently reviewed[1] 180 cases of endemic (murine) typhus fever observed at the Charity Hospital of Louisiana at New Orleans during the period from January 1, 1929, to December 31, 1944. We were surprised to find that approximately one-half of these cases had occurred during the past three years. This is in keeping with the statistical incidence[2] collected by the United States Public Health Service. Thus, for the ten year period from 1935 to 1944, 28,979 cases of endemic (murine) typhus fever were reported in the United States. In 1935, the annual incidence was reported to be 1,287 but beginning in 1942 a sharp increase occurred which reached a maximum of 5,337 cases during 1944. It is of further interest to note that the disease is essentially a problem of the Southern states, 75 per cent of the collected cases being reported from three states alone—Georgia, Texas and Alabama. However, the disease occurs in practically all parts of the world.

It is difficult to reconcile the marked increase of typhus fever with more general awareness and improved methods of diag-

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nosis. Typhus has been prevalent in the South for many years. One of the earliest reports was that by Paullin[3] of Atlanta in 1913. Additional papers [4-7] followed shortly thereafter attesting to the frequency and need for recognition of the disease by Southern physicians. The evidence seems indisputable that the increase in typhus is real. Typhus, therefore, enters into the diagnostic possibilities of diseases giving rise to fever of undetermined origin and for that reason we may profitably consider the clinical aspects as based on a composite picture of our 180 cases.

CLINICAL MANIFESTATIONS

Etiology and Transmission: The etiologic agent responsible for endemic (murine) typhus fever is a rickettsial organism morphologically identical to that producing the classic, epidemic, louse-borne, European type. As pointed out by Mooser[8] in 1928 the organism producing endemic typhus, *Rickettsia prowazeki mooseri*, differs from that producing epidemic typhus, *Rickettsia prowazeki prowazeki*, in that the former produces a pronounced scrotal reaction in guinea pigs.

Epidemiologic differences also exist. The virus of endemic typhus has a reservoir in rats and possibly in other rodents. It is transmitted from rat to rat by rat fleas (*Xenopsylla cheopis*) and rate lice (*Polyplox spinulosus*). Experimental evidence to date has failed to demonstrate rickettsial organisms in the salivary glands of the rat fleas nor has successful transmission of the disease by the bite of the flea occurred. Evidently the organisms are transmitted to man by the rubbing of infected feces through abrasions in the skin and the like and it is not unlikely that transmission of the disease can occur through inhalation or ingestion. An infected rat flea may harbor the Rickettsiae for a month or more following recovery from the infection.

These facts clearly delineate the essential features of transmission of the disease to man. Typhus is obviously found most frequently in those persons who work or dwell in environments infested by rats, such as food handling establishments. In our group, 40 patients, or 44.44 per cent, were food handlers, including housewives, but other occupations were represented such as farmers, shipyard workers, common laborers, mechanics, carpenters, and plasterers, so that inquiry concerning occupation of the individual does not always aid in diagnosis. It is apparent also that endemic typhus is not confined to the poorer classes of people nor are any significant differences apparent in race, age or sex. As one would expect, the highest incidence occurs in the summer and early fall. Thus, 128 of our cases occurred in the period from June to October inclusive, although the remainder were scattered throughout the other months of the year. The preponderance of cases (69.44 per cent) were from metropolitan New Orleans though rural communities were not exempt. Almost 10 per cent of our patients lived on farms.

Clinical Picture: We do not propose here to enter into an encyclopedic presentation of the clinical features of typhus fever. Several recent articles by Musser,[9] Joseph,[10] Dyer,[11] Nadler,[12] Stuart and Pullen,[1] and others have amply described the disease. The fact that 75 per cent of our patients entered Charity Hospital with diagnoses other than typhus fever indicates only too clearly that the clinical picture in the beginning at least cannot be distinguished with accuracy from other febrile illnesses. It is of some interest to note the various admitting diagnoses. The most common were: typhoid fever, pneumonia, malaria, influenza, pyelonephritis, virus pneumonia, measles, and drug rash. Less common diagnoses were: secondary syphilis, undulant fever, arsenical hepatitis, subacute bacterial endocarditis, cholecystitis, central nervous system syphilis, intestinal obstruction, pelvic inflammatory disease, meningococcemia, upper and lower respiratory tract infections, encephalitis, cerebral concussion, infectious diarrhea, poliomyelitis, plumbism and tuberculosis.

Exclusion of these clinical entities and establishment of the diagnosis of typhus fever often led to extensive laboratory investigations such as blood cultures, blood

smears, urine cultures, spinal fluid surveys, blood urea nitrogen determinations, blood glucose determinations, icterus index, and serum proteins in addition to the standard procedures of hemograms and urinalyses. To obviate such expenditure of time and effort, it is desirable that typhus be borne in mind early in the diagnostic survey of patients with acute febrile illnesses.

In general, the clinical picture of our patients was as follows: The incubation period varied from four to fifteen days. In 84 patients, prodromata consisting of malaise, headache, cough, nausea, chest pain and coryza were present for one to ten days, averaging 2.7 days. In 96 patients (53.33 per cent), the onset was sudden with chilliness, severe headache, marked weakness or prostration, nausea and vomiting, generalized bodily aches and pains in the chest, back, limbs and abdomen, and fever which rose rapidly or by successive steps to reach its maximum of 104°-105° F. by the end of the first week. During the first week there was little distinctive symptomatology. Recurrent chills and chilliness were prominent in many patients. The neuromuscular manifestations included headaches, which were persistent, variable in location, severe and not easily relieved, as the most frequent complaint but likewise included varying degrees of mental disturbances ranging from confusion and delirium to coma, stupor and lethargy. Respiratory manifestations of a non-productive cough, coryza, sore throat and chest pain were present in variable degrees in over half of the patients and progressed to bronchopneumonia in a few cases. Symptoms referable to the gastrointestinal tract were numerous and quite troublesome but did not present any untoward difficulties: nausea and vomiting, 36.11 per cent; diarrhea, 10.55 per cent; constipation, 26.67 per cent; abdominal pain, 21.67 per cent; and abdominal distention, 9.44 per cent.

The most significant feature of the physical examination was the rash characteristic of typhus fever. This was present in 65 per cent of our patients. The rash usually consisted of few pinkish macules from one to five mm. in diameter which disappeared on pressure. Characteristically the rash appears on the fifth day of the disease but some of our patients developed a rash by the second day and as late as the eighth day. The rash developed first on the abdomen then spread peripherally to involve the chest, back, shoulders, arms and thighs in that order. It rarely itched. As the exanthem aged, it became papular and then did not blanch readily on pressure. The duration of the rash varied from two to nine days, averaging six days and usually had disappeared entirely by the time of defervescence of the illness. Obviously, the rash is more difficult to discover in negroes but this will depend on the variations in color of the patients. A rash was observed in 20 per cent of our negro patients.

Other pertinent findings in the physical examination included conjunctival injection in half of the patients, pulmonic rales in the bases of both lungs, palpable enlargement of the spleen in 32 per cent and of the liver in about 7 per cent.

DIAGNOSIS

We may summarize the diagnosis of typhus fever by stating briefly that it should be thought of in the consideration of any acute infectious disease characterized by a sudden onset and a sustained febrile course which terminates in about two weeks by crisis or rapid lysis. In the presence of an epidemic, little trouble may arise but the isolated sporadic case offers more difficulty. In addition to the clinical picture, several presumptive aids in the history and physical examination are: (1) history of contact or dwelling in a rat-infested environment; (2) the characteristic macular rash which appears about the fifth day; and (3) negative clinical or laboratory evidence for other infectious diseases.

Confirmation of the diagnosis of typhus fever depends upon laboratory data. The routine, ordinary laboratory procedures are of little value except for the negative data they supply. A mild leukopenia was observed in our cases during the first week of the disease. An increase in blood cells

occurred thereafter so that a mild leukocytosis was evident during the second week. The differential count fell within normal limits. Transient albuminuria due to an increased capillary porosity resulting from the febrile reaction was seen in a few cases.

The most useful laboratory test is the Weil-Felix reaction or the agglutination of certain strains of the *Bacillus proteus vulgaris* called OX_1 and OX_2. This becomes positive in titers of 1:80 or above at the end of the first week (by the fifth day in three of our patients). This test, however, does not differentiate between typhus fever and Rocky Mountain spotted fever or other rickettsial infections. To effect such distinction, it is imperative that other procedures be followed: (1) complement fixation phenomenon for both typhus and Rocky Mountain spotted fever; (2) biopsies of the macules of the skin; and (3) cross immunity tests by inoculating male guinea pigs and white male rats. These procedures as well as the differentiation of typhus fever and Rocky Mountain spotted fever have been considered in detail in an earlier paper[13].

COURSE AND PROGNOSIS

The mortality of endemic murine typhus is very low, probably less than one per cent. The most frequent cause of death is bronchopneumonia. Typhus is serious, however, in the aged. There were no deaths in our series of cases. We do not have sufficient data to evaluate the incidence of sequelae or other complications but many writers doubt if any can be attributed to typhus.

TREATMENT

There is no effective therapy of typhus fever. As has been stated above, the disease is self-limited and has few or no sequelae. The physician is obligated, however, to maintain nutrition, especially vitamin B complex, adequate protein intake, and abundant fluids, provide sufficient comfort and rest, and treat symptomatically. In that connection, good nursing care is of paramount importance.

Specific Drugs: There are no specific drugs of proved value in typhus fever. Considerable evidence indicates that the sulfonamides may be deleterious in rickettsial infections, hence if used they should be limited to secondary infections and complications of typhus. Pinkerton and his coworkers[11, 16] have shown penicillin to be of value in experimental typhus in laboratory animals but adequate clinical trial has not been given to date to warrant any conclusions. As with the sulfonamides, penicillin may be indicated in the secondary complications of typhus fever. Serum preparations have not fulfilled their expectations. We would call attention to a recent report by Yeomans and his group[16] concerning the efficacy of para-aminobenzoic acid in louse-borne typhus fever. We have had no experience with this drug in endemic typhus fever.

Prevention: This concerns chiefly the eradication and control of rats by poisoning and trapping, disposal of garbage and maintenance of sanitary conditions generally, and rat-proofing of buildings. The latter is probably the most effective, long-range program. A slovenly environment predisposes to rats and thus to the hazard of typhus fever. Immunization to typhus fever by a vaccine prepared from living cells as a medium is of value in the individual patient who must work in a rat-infested habitation but is not practical as a community measure since typhus is sporadic and bears a low mortality.

SUMMARY

The purpose of this paper is to emphasize the remarkable increase of endemic (murine) typhus fever during the past three years in Louisiana as well as elsewhere in the South. Physicians are urged to consider typhus in the differential diagnosis of all acute infectious diseases and to pursue laboratory investigations that will lead to a correct impression.

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RUPTURED RIGHT ETHMOIDS WITH ORBITAL CELLULITIS*

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This case is being presented not because of its unusual rarity or severity, but merely because therapeutically it possibly shows some advances over methods formerly employed.

CASE REPORT

This young man, aged nine, was operated at Mercy Hospital on August 14, 1944, for tonsillectomy and adenoidectomy. He remained in the hospital approximately 24 hours, at which time he was discharged to his home where his convalesence continued. His convalescent period was very normal, getting around after the third day and showing no untoward symptoms. He was discharged as cured on August 26.

On August 28, two days later, I was called and informed that the boy had a slight trickle of blood from his right nostril with apparently some swelling of the inner aspect of the right eye. At that time too, there was some low grade fever. The parents were advised to present the boy at the office as soon as convenient, more so for the trickling of blood from the nose, adjudged to be adenoidal, than for the eye swelling.

On examination it was noted that there was considerable swelling over the right ethmoid region, inner canthus of right eye and both lids. There was marked lateral displacement of the right eye with some proptosis. Intranasal examination revealed an acutely congested nose with a small accumulation of blood in the region of the middle meatus, but no active bleeding. There was no blood in the nasopharynx or pharynx as might be expected with adenoidal bleeding and it was concluded that the bleeding was entirely nasal even though minimal.

An eye consultation was had and the opinion rendered was that there was retrobulbar cellulitis, possibly metastatic, or extension from sinuses. X-rays were taken at once and reported marked cloudiness of the right ethmoids and partial cloudiness of right antrum, all other sinuses normal.

Topical applications of the nose were done, one gram of sulfadiazine given every four hours for four doses, then one-half gram every four hours ordered, plus warm boric compresses and astringent and antiseptic nose drops.

He was seen the following day and it seemed as though the swelling was more pronounced, both lids approximated by swelling and the space between the inner canthus of the eye and the midline of the skull very much widened. The sanguineous discharge had persisted, but occasionaaly pus was noted in the drainage. The therapy seemed to stagnate things about this stage, the closure of the eyes was not so tight, the swelling somewhat softer, and there appeared rather frank suppuration in the nose.

On August 31, despite the fact that drainage was fair, swelling somewhat softened, palpebral opening broadened, there appeared a mild edema at the inner canthus of the opposite eye. Hospitalization was done at this time and penicillin added to the treatment already being done.

Sulfa determination at this time showed only a trace. Blood picture revealed 9,000 white blood cells with 6 per cent polys, 3,700,000 red blood cells with 78 per cent hemoglobin. Blood culture taken on admission was negative.

He had slight up and down temperature while in the hospital but never recorded more than 100° F. Twenty-five thousand units of penicillin given every three hours intramuscularly for 72 hours; was given a total of 600,000 units.

There was appreciable change in the right eye after 24 hours and the edema which had started up in the left eye had disappeared. After 48 hours the swelling had subsided to such an extent that he could open his right eye almost completely and the lateral displacement was less noticeable. After 72 hours such improvement had taken place that penicillin was discontinued. There remained only a pinkness of the lids with some displacement laterally and only minimal nasal discharge. Nasal care and sulfadiazine were persevered with for 48 hours longer, at which time improvement had been so complete as to allow the patient to be discharged.

DISCUSSION

The effects of the penicillin, sulfadiazine and limited nasal drainage far surpassed

*Read before the Orleans Parish Medical Society, April 9, 1945.

expectations. It was hoped that stabilization of the infection could be accomplished, at which time operation for complete drainage would follow, with hope for ultimate good results. Operation was never done because clinical improvement was so complete and fast.

He was carefully watched for a short period of time longer to safeguard against any exacerbations and nothing to this day has been noted.

X-ray pictures taken only recently, March 19, 1945, to check against previous films, show there is marked clearing of the ethmoidal region with some slight haziness of the right antrum. Clinically there is no evidence of any trouble in the nose, no recurrence of nose bleeds and the right eye has returned completely to normalcy.

DISCUSSION

Dr. E. Z. Browne (New Orleans): I would like to ask Dr. Thomas if he thinks penicillin helped to improve the ethmoiditis. Did it improve the sinus condition?

Dr. H. Ashton Thomas (in closing): I frankly believe it did, but of course I think drainage was helpful. I feel without penicillin I could not have waited on this case and would probably have had to use external drainage and such. The pictures show such improvement and I think this is due to penicillin; possibly due in part to sulfadiazine. I feel that acute sinus conditions could be helped by penicillin; but I do not think there is much hope for chronic conditions with these measures.

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SOME NOTES ON THE EARLY HISTORY OF PULMONARY TUBERCULOSIS IN LOUISIANA*

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The early history of pulmonary tuberculosis in the state of Louisiana probably corresponds with the history of tuberculosis in the rest of the United States. There is no mention in the early medical literature of Louisiana of phthisis or consumption. Occasionally one finds in plantation records a slave listed as having died of the white plague. But until the 1840's the literature is barren in regard to tuberculosis, so much so that one may erroneously conclude that phthisis was unknown in the early history of our state. Of course this was far from the case. Tuberculosis was present and persons were dying from it, but it was so less spectacular than yellow fever, cholera or the various types of fevers then prevailing that the medical and lay public were not conscious of its destructive force. When the physicians became somewhat aware of the seriousness of the mortality rate from tuberculosis, many were the fantastic claims advanced by some as to the effectiveness of the therapeutic methods devised by them for the curing of this malady. So spectacular were some of these methods that probably one is justified in terming this early era the "sensational" period. This period did not last long as far as years go, but it was very interesting because of the methods advocated for the cure of tuberculosis.

The first of these "sensational methods" was by a Dr. Hall, who in 1844 published a pamphlet entitled, "Consumption Curable."[1] Just who was Dr. Hall, it is not possible to assert with any degree of assurance. He states that he is a resident of New Orleans from November 1 until May 1 of each year. From consulting the Index Catalogue of the Library of the Surgeon-General's Office, it was found that there were a number of pamphlets listed with similar titles written by Dr. William Whitty Hall (1810-1876), so one may suspect he was also the author of "Consumption Curable."

Dr. Hall was a graduate of Transylvania Medical College, one of the best medical schools in the United States at this time, so that one may classify him as a reputable physician.

In the beginning of his pamphlet, Dr. Hall gives a general description of consumption for the public. His description is probably not far wrong, and it comes rather as a shock to read that section entitled, "What do you do for consumption?" to find this introductory statement:[2]

"The most interesting reply, at least to the patient is—I cure it. Tubercles are absorbed, taken away or encysted. Large

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*Presented before New Orleans Parish Medical Society June 11, 1943.

cavities are encased, small ones healed up. This is done in a manner not disagreeable, calomel, emetics, blisters, caustics, seatons and issues, not being used. It is accomplished by a method unknown to the world, until within a short time past, and the success which has attended the judicious employment of the means used, has been uniform, and encouraging in the highest degree. Already there are men of high moral worth, all over the Union, who are prepared at any day or hour, when properly approached to bear a decided, and grateful testimony in its favor."

Dr. Hall then describes how simple and beneficial is his treatment. Most patients require only one or two visits to his office, although a few must make several visits over a period of some weeks. He next cites a number of cases which he had treated and cured. In some instances patients were suffering from troublesome coughs, night sweats and expectoration of blood, but in all cases, after he prescribed, they immediately became better and were eventually restored to health. There were also several testimonial letters from grateful patients attesting to their cures.

By this time one becomes very curious as to the therapeutic methods of Dr. Hall since his successes were so extraordinary. However, when it came to divulging his remedy or treatment, Dr. Hall has this to say:[3]

"It is not designed at present to communicate the means employed . . . Let it, however, be distinctly noted, that I am under proper circumstances, perfectly willing to communicate all I yet know, to any well educated young physician of genius, talent, of a towering ambition, who will give suitable guarantees, that he will devote his whole life, exclusively, to the mode of practice adopted by me, and to its improvement, in the treatment of this one disease . . ."

Another cure for consumption was advanced by Dr. Samuel A. Cartwright, who at this time was one of the most famous physicians in the deep South. A bibliography of his writings includes over 80 entries. Writing in the Boston Medical and Surgical Journal for the years 1852 and 1855 he advanced a method for the cure of bronchial, dyspeptic and consumptive complaints, which became known as the "Sugar-house cure."

It was common knowledge among the sugar planters that during the grinding season those workers and slaves employed in the sugar-house gained weight, became cured of any bronchial disturbances, and a general improvement in their health was noted. Aware of this condition, Dr. Cartwright began recommending to those suffering from chest complains that they spend several weeks during the grinding season in the sugar-house, drinking the cane juice and inhaling the vapors from the kettles. Dr. Cartwright reported some remarkable successes by this method of treatment. His patients gained weight, in one case as much as 15 pounds in three weeks, coughs disappeared, and at the end of the season their health was very much improved. Dr. Cartwright makes no fantastic claims. He clearly states those suffering from advanced tuberculosis could expect no relief or cure by this method. However, so much publicity was given to this method of treatment that the sugar-houses were soon swarming with those seeking a cure, until the owners began to complain that their refineries were becoming nothing but dispensaries. Also it was becoming very inconvenient to have patients die on your hands.

Probably the clearest statement as to what was taking place in the diagnosis and treatment of tuberculosis of this period was editorially stated by Dr. A. Hester, then editor of the New Orleans Medical and Surgical Journal. Dr. Hester in reviewing the book entitled, "The Young Stethoscopist" made this comment:[5]

"But notwithstanding the perfection in our diagnostic means in thoracic disease, have we advanced the treatment thereof in anything like the same ratio? Has any method been devised by which a cavity can be made to cicatrize and heal; by which tubercles can be driven from the lungs, or, in a word, by which any serious organic disease of the lungs or heart can be permanently cured or even relieved. With a few

exceptions we can answer these questions in the negative. We do not however, despair that the time will come when many of these diseases now considered incurable, will be made to yield to a more enlightened and rational system of therapeutics."

On the other hand this early period was not without its advances. Following in the footsteps of the great French clinicians, tremendous progress was made in the diagnosis of diseases of the chest as stated by Dr. Hester. Dr. Austin Flint, a leader in the diagnosis of chest disorders in the United States, held a professorship in the New Orleans School of Medicine for a few years and also gave private lessons in the art of percussion and auscultation. However, many decades were to pass before therapeutic methods were to equal the art of diagnosis.

During the war, and for some years following, medical culture made little advances in the state. It seems as if making a living was such an arduous task that very little time or leisure could be devoted to the cultivation of the art and sciences. One might say for this era that a hiatus existed as far as advances in medicine were concerned.

The year 1880 may be considered as opening a new era in medical advancement in Louisiana. In that year Dr. Joseph Jones became president of the State Board of Health. So great was the energy of this man that almost single handed he gave a new impetus to the advancement of medical culture in the state. Every field of medicine felt his influence. His "Memoirs" and the Reports of the Board of Health for the year of his presidency (1880-1884) are a mine of information as to the status of medicine in Louisiana. Undoubtedly, the statistics he compiled had a great deal to do with educating the medical public as to the danger of pulmonary tuberculosis.

The next period in the history of tuberculosis in Louisiana may be called the "bacillus" period, and if one wishes to be technical, we may let it run from 1882 to 1904. The first date is selected for in that year Robert Koch discovered the tubercle bacillus in the sputum; the latter date because in that year Dr. W. J. Durel introduced scientific methods in the treatment of tuberculosis by the establishment of his sanatorium in the environs of Covington.

The whole of this period is overshadowed by the fight over the recognition of the bacillus as the cause of the disease. It was many years after the announcement of this discovery by Kock that the bacillus became generally accepted as the cause of tuberculosis by the medical profession. The controversy over its acceptance involved the best medical minds of that day, and had its counter part in New Orleans. Dr. H. D. Schmidt, pathologist for the Charity Hospital from 1875 to 1887, a German emigrant, and an excellent pathologist, was one of those who opposed the acceptance of the bacillus at this time. However, it was Dr. Schmidt who first introduced the study of bacteriology to a New Orleans group. Gathering a number of young internists, as they were then called, among whom were Drs. Rudolph Matas, P. E. Archinard, A. McShane and a Dr. LaPlace and Dr. LeBlanc among others, he organized this group into what may be called the first pathological society in New Orleans and gave them their first introduction to bacteriology. In time, so great became the controversy over the recognition of the bacillus that Dr. George Lawrson was finally sent to Philadelphia to have the bacillus demonstrated to him. He was probably the first New Orleans physician to have this privilege.[6]

Another controversy that raged at this time was over the use of tuberculin as a vaccine. During the '90's, Dr. Karl Von Ruck of Asheville, North Carolina, was a strong advocator of the use of tuberculin therapy. He maintained a sanatorium at Asheville where many patients from New Orleans suffering from tuberculosis were sent for treatment. In October, 1895, a committee from the Orleans Parish Medical Society composed of Drs. J. H. Bemiss, John B. Elliott, Sr., Joseph Holt, A. J. Bloch, H. S. Lewis, E. Souchon, J. D. Bloom, Rudolph Matas, F. Loeber, C. Chassaignac, C. J. Landfried, A. McShane, P.

E. Archinard and O. L. Pothier, invited Dr. Von Ruck to come to New Orleans in order to demonstrate the use of antiphthisin. The experiment was commenced in November, 1895. All cases medical and surgical, were examined by their respective committees, in conjunction with Dr. Von Ruck. The average duration of the observations were from two to three months. The commission presented its report to the society at the regular meeting held March 28, 1896, about four months after the inauguration of the trial. The committee reported that from the tests, the curative value of antiphthisin was inconclusive and, as a whole, unproved, although some benefits were obtained from its use in early cases.[7]

Also during this period many fantastic remedies were brought forth for the cure of tuberculosis. Among them may be mentioned such therapy as living in dairies breathing the dung of cows, the taking of innumerable baths, the breathing of chloroform, the eating of grapes and the use of various serums. There was also the diet treatment which in one case consisted in the eating of large quantities of oysters, the consuming of large and frequent doses of hot water, and the eating of carefully chopped beef and stale white bread. Then let us not forget "Angier's Petroleum Emulsion" which claimed: (1) to antagonize the progress of the disease, (2) to palliate the symptoms; relieve the troublesome cough; reduce fevers and eliminate night sweats; (3) to pacify the irritable stomach, and make it receptive of food and medicines. The merits of this "Emulsion" were extolled in medical journals of 1905. Another remedy which had many supporters was the administering of creosote. Dr. E. M. Dupaquier in the July, 1903 number of the New Orleans Medical and Surgical Journal gave a rather extensive review of the history of this therapeutic agent; the means employed by him in the administering of this drug and his results.

But all of these remedies had their day and their supporters. Some were in vogue longer than others but in time all gave way before the modern concept of the treatment in sanatoria, and the employment of pneumothorax and surgery.

However, the story of the introduction of our modern methods of treatment in Louisiana, which began with the work of Dr. W. J. Durel during the first decade of this century must be told at another time. This is only a brief outline of what took place in the state during the first two epochs when the medical world was trying so hard to find the cause and arrest the course of the white plague.

In order to convey some idea as to the mortality from tuberculosis in New Orleans during these early years the following statistics are herewith appended. They were taken from the Reports of the Louisiana State Board of Health for the years 1881 through 1890.

MORTALITY FROM PULMONARY TUBERCULOSIS[8]
New Orleans

	Deaths		Population	
	W	C	W	C
1849	445	147	91,431	28,029
1850	528	146		
1853	582	173		
1877	513	375	140,923	50,456 (1870)
1880	517	346	158,367	57,617
1883	501	344		
1885	544	402		
1887	434	339		
1890	444	380	177,376	64,491

Probably if there are any comments to make one cannot help but notice the difference between the deaths among negroes prior to the War Between the States and afterwards. The mortality more than doubled for negroes although there was little change in the whites, notwithstanding the increase in population.

Another interesting comparison was made between the mortality from tuberculosis and the total death rate for the three different periods, 1844-65; 1866-80; and 1881-90.

MORTALITY FROM PULMONARY TUBERCULOSIS
New Orleans

	1844-65	1866-80	1881-90
Total deaths	67,236	45,524	65,464
white			41,483
colored			23,981
Death T.B.	12,368	11,703	8,644
white			4,898
colored			3,746
Percentage	18.0	25.8	11.7

Here again one may note the increase of the percentages of total deaths from tuber-

culosis following the war. From the number of actual deaths it can readily be seen that this increase was due to the increased mortality among the negroes. In time as the negroes began to learn to care for themselves, the percentage of total deaths began to decline.

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HISTORY OF BLOOD TRANSFUSION.*

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FOREWORD

The fascinating and romantic tale of blood transfusion is a true replica of the history of medicine itself. It begins with the superstitions of pre-historic peoples and trickles into the mystic dabblings of ancient alchemists and philosophers. It continues through tragic centuries of ceaseless groping and blundering to reach, finally, the discovery and development of the modern technics of today. The story does not stop there, but continues into the many new problems which were opened by every precious bit of truth that was uncovered. The tale is dynamic, moving, inspiring; and it symbolizes the Spirit of Medicine to which this chronicle is respectfully dedicated.

HISTORY OF BLOOD TRANSFUSION

No one knows exactly when the history of blood transfusion began. Although there is no record of it, pre-historic man certainly pondered over the mysteries of the red liquid that flowed from the bodies of injured and dying creatures. We know that ancient philosophers speculated upon the qualities of this substance, which they called a "vital force."[1] To them, it was the seat of the soul, since its loss was associated with the loss of life. They even tried to use it in the revitalization of the aged and debilitated, seeking to substitute young, vigorous blood for that which had lost its potency.

The methods by which they effected this substitution consisted of bathing in, drinking, and possibly infusing blood from young to old individuals. Blood baths were used by the Egyptian princes for resuscitation and recuperation.[2] Ovid[3] wrote of the powers of the sorceress Medea to restore youth by the use of draughts of blood. Celsus[4] deplored the custom of the Roman people who rushed into the gladiatorial arenas to drink the fresh blood that flowed from the veins of dying victims. On the other hand, Pliny[5] and Galen[2] both prescribed the drinking of gladiatorial blood as a cure for epilepsy and other diseases. The Egyptians, Syrians and Hebrews were all credited with performing "transfusions," while Greek and Roman writers are supposed to have witnessed them.

Thus, because of their desire to prolong and restore life, the ancients maintained an interest in the use of blood as a therapeutic agent. As a corollary, they also speculated on the origin and the circulation of blood. Aristotle[6,7] taught that the blood was formed within the chambers of the heart and flowed out to the various parts of the body, never to return. Centuries later, his concept was displaced by the idea that the arteries carried air directly from the lungs to the tissues. This concept, in turn, was finally displaced by the belief of Galen[2,7] who stated that blood was generated by the liver and moved back and forth in the vessels until it was consumed. Incidentally, like many of Galen's theories, this one persisted for a long time; it held undisputed sway for over 1400 years!

* * *

The first recorded attempt at blood

*Presented before the History of Medicine Society, Tulane University, March 23, 1945.

"transfusion" occurred in 1490 A. D., when Abraham Meyre, a Jewish physician, attempted to "transfuse" the blood of three youths into Pope Innocent VIII. According to Villiari,[8] the Pope had had an apoplectic stroke the year before and had fallen, for sometime, into a kind of somnolence. All means to revive the exhausted Pope had failed, and, in desperation, it was agreed to place him under the care of a Jewish physician who proposed to do a blood "transfusion." From this point, the rest of the story is variously told and vigorously contested. Raphael Sabatini[9] says that too much blood was taken from the youths, and all of them died. The Pope, on hearing of this, was horrified. He refused transfusion and the physician fled. Other writers insist that the blood was withdrawn for the purpose of preparing a distillate which the Pope was going to drink.[2] On the other hand, many authors agree with Villiari[8] that an actual intravascular blood transfusion was attempted. This is supposed to have been unsuccessful, the Pope and the youths all dying of air embolism.

There is no assurance that the Pope received either a draught or a transfusion. If anything was done, he probably received a draught. During the Middle Ages, the drinking of blood was popularly considered as a health-restoring measure; and, in older records, the ingestion and "transfusion" of blood were often confused. One thing the authorities all agree on—the death of the Pope was not staved off; the three youths all died; and the Jewish physician fled as quickly as possible after the failure of his experiment.

The disastrous experiment of the Jewish physician must have stifled interest in blood transfusion, for no significant work was done until nearly one hundred years after this episode. In 1588, however, Andreas Libavius,[10] a native of Saxony and professor of poetry and history at Jena, described in full the technic for the intravascular transfusion of blood from one human to another. His experiment was supposed to have been done by means of two interlocking silver tubes that connected the artery of a young man to the artery of an old man. "And," said Libavius, "the hot and spirituous blood of the young man will pour into the old one, as it were from a fountain of life, and all of his weakness will be dispelled. . . ."

The priority of Andreas Libavius, in suggesting intravsacular blood transfusion, however, is disputed. The dispute rests upon the sporadic references to blood transfusion found in the literature of the century that elapsed between the work of the Jewish physician and that of Libavius. During this century, the Renaissance had reached full bloom, and the ancient Greek and Roman writers were studied ardently. During the course of these studies, the ancient theories that described blood as the "staff of life" were uncovered; and they caused a number of writers[2] to suggest the possibility of transfusing blood from one human to the other. Unfortunately, however, these men did not describe the experiments they recommended, and Libavius is given priority for the idea.

However, there is some question as to whether or not Libavius actually believed in the experiment he described. His script is written in an ironical tone, and many historians feel that he wrote extravagantly, not because he was a serious advocate of blood transfusion, but simply to emphasize his contempt for the operation as quackery and charlantry.[11] Using this as a thesis for their arguments, the Italians claim priority for Jean de Colle, of Padua, whose writings seriously suggested blood transfusion in 1628, some thirteen years after the work of Libavius.[12]

This question, incidently, is of more than passing interest. If Libavius actually performed his experiments, he was indeed a brilliant man. He would thus have used intravascular blood transfusion before Harvey described the circulation of blood; and the technic which he described is very similar to that advocated by Bernheim in 1912.[13] Regardless of who first suggested intravascular blood transfusion, however, the idea had been born. Therefore, when Harvey electrified the scientific world, in 1616, with his discovery of the circulation

of blood, the stage was set for the modern developments in blood transfusion to begin.

The year 1616 marks the beginning of the scientific approach to blood transfusion. Before this the experiments on this subject were prompted by vague notions of restoring and maintaining youth, and were attempted by a multitude of dabblers who often wrote fantastic theories and made extravagant claims without bothering to prove them. Harvey's work, however, was based on scientific observation; and, for the first time, it gave a firm, unquestioned foundation on which further experiments could be based and judged.[14]

Harvey, when he expounded his theory, held a position as physician to St. Bartholomew's hospital, having been appointed to that post in 1609. He stated his theory in 1616, during his lectures; but his work was not universally known until its publication in 1628. Once it was released, however, it stimulated, throughout the world, energetic experiments on the infusion of various substances into the blood stream.

* * *

No authentic reference to attempted blood transfusion can be found during the thirty years that followed Harvey's publication. However, a few interesting early claims do exist. In 1654, Franscesco Folli,[15] a Florentine physician claimed to have performed the first transfusion of blood, before the Grand Duke Frederick II. The instrument he used consisted of a silver tube, inserted into the artery of the donor, and a cannula of bone, inserted into the vein of the recipient; the two tubes were connected by a hollow pipe made from the blood vessel of an animal. It is possible that Folli actually performed the operation he described. However, after a complete investigation of the question, Mayerhofer feels that Folli merely explained the technic to the Duke Frederick, and did not actually attempt the experiment.[16,17]

The French also have several claims to priority in the performance of blood transfusion.[1] In 1653, Robert de Gabets, a Benedictine monk supposedly first demonstrated the possibility of transfusion, then performed the operation five years later. Even his instruments and technic (which are similar to those of Folli) have been described. Tardi, in 1667, also claims to have been one of the "inventeurs" of blood transfusion, and describes in detail the artery-to-vein anastomosis technic. However, these and other claims cannot be substantiated; and the identity of the first attempted human transfusion is still a mystery.

* * *

In 1656, Sir Christopher Wren,[18] the astronomer, author and architect, experimented with the injection of various medicaments (such as ale, wine, scammony and opium) into the veins of dogs. He used a direct cannula connected to a bladder by means of quills. With this apparatus, he attempted to force the experimental fluids out of a container, through one of the quills, into the bladder, thence, via the second quill, into the animal's veins. Unfortunately, he lacked the present day valves and syringes, so that his experiment failed. However, though he did not realize it, he had designed the basic structure for all of our modern syringe methods of person-to-person transfusion. Furthermore, Wren stimulated his friends Wilkins, Robert Boyle, Clarke, and Henshawe to experiment with him; and these, in turn, led Richard Lower to begin his attempts at the transfusion of blood from one animal to another.

Most of the experiments done by these men were failures. However, in 1665, Richard Lower finally connected the artery of one dog to the vein of another and found that the blood flowed successfully from the atery of the donor into the vein of the recipient.[19] Before he hit upon this successful idea, Lower had performed innumerable evperiments with vein-to-vein anastomoses, only to find that the blood flowed so slowly that it coagulated in the anastomosing cannula. However, he knew from experience that the entire blood supply of an experimental animal could flow from its body, if a large vessel were injured and the blood flow were not obstructed. Reasoning from these facts, and applying Harvey's theories on the circulation of blood—namely, that

blood was pumped by the heart from the arteries into the veins—Lower decided to try an artery-to-vein anastomosis, hoping that the blood would flow rapidly enough to prevent coagulation in the cannula. He based his hopes on the observation that blood flowed more freely from injured arteries than from injured veins. His observations and deductions were correct, for his first experiment with artery-to-vein anastomosis was successful. Lower performed his experiments in Oxford and later in London; and the news of his success spread throughout the world. He finally demonstrated his work to the Royal Society and created such a furor that Samuel Pepys mentions the demonstration in his diary,[20] saying:

"Dr. Croone told me, that, at the meeting at Gresham College tonight . . . there was a pretty experiment of the blood of one dog let out, till he died, into the body of another on one side, while all his own ran out on the other side. The first died upon the place, and the other very well, and likely to do well. This did give occasion to many pretty wishes, as of the blood of a Quaker to be let into an Archbishop, and such like; but, as Dr. Croone says, may, if it takes, be of mighty use to man's health, for the amending of bad blood by borrowing from a better body."

Incidentally, other entries in Pepys' diary speak of a series of further trials of Lower's experiment to be done by the Royal Society. These trials included attempts to do human transfusion. Lower and other members of the Royal Society carried them out; and, finally, on November 30, 1667, Lower and King performed the first successful human transfusion in England, on a lunatic who received 20 shillings for his trouble. Sheep's blood was used for this transfusion; and this experiement was then used as proof of the then prevalent belief that human blood was less compatible with itself than with the bloods of other animals.

The work of Lower and King on human blood transfusion, however, was not the first of its kind. Even as Lower completed his early experiments in England, there worked, in France, a Montpellier physician, philosopher and mathematician, Jean Baptiste Denis,* who, in June, 1667, performed the first successful human blood transfusion and thus won for himself an immortal place in the annals of medical history.[21] Denis' first patient was a 15 year old boy who was suffering from an acute attack of an obscure fever. During his illness, the boy had been subjected to twenty venesections, which had failed to cure him and had left him in a state of apathy and exhaustion. As a last resort, Denis transfused the youth with nine ounces of blood from the carotid artery of a lamb; and a remarkable improvement followed.

His enthusiasm awakened, Denis, with his assistant Emmeris, performed a second transfusion on a perfectly healthy man. This was purely in the nature of an experiment, in which Denis removed ten ounces of blood by venesection and permitted approximately twice that amount to flow from the femoral artery of a lamb into the vein of his human subject. When the experiment was completed, the subject was rewarded financially for his cooperation. He then repaired to a public house where he spent his remuneration, without suffering any ill effects from the transfusion. Denis then became renowned as a great transfusor; and, at the same time, there arose a storm of hatred, opposition and jealousy that involved arguments concerned with metaphysics, religion and personal animosities.#

In spite of the storm of opposition, Denis continued his experiments. He performed a third transfusion on a moribund patient; this, however, served only to delay death for a few hours. Then, he began his fateful fourth transfusion, which developed complications that buried Denis and his operation for the next hundred and fifty years. This fourth transfusion was performed on a

*Denis at this time, was also physician to Louis XIV

#Richard Lower, though not a violent opponent of Denis, wrote that Denis was trying to deprive him of credit which rightfull belonged to him.

lunatic. In all, three operations were performed. The first two transfusions on this patient were successful and partially alleviated his mania. The lunacy, however, recurred; and, on the insistence of the patient's wife, Denis performed the operation for a third time. Following the last introduction of blood, the patient developed what we know today as a "transfusion reaction." Denis wrote that "his (the patient's) arm became hot, the pulse rose, sweat burst out over his forehead, he complained of pain in the kidneys, and was sick at the stomach. The next day, the urine was very dark, in fact black."[21] Following these findings, the patient died; and the enemies of Denis conspired with the widow to charge him with murder. There followed a prolonged legal battle, during which Denis counter-charged that the patient had been poisoned by his wife. Denis was finally exonerated, but further transfusions were prohibited unless they had the approbation of the Faculté de Médicin of Paris. Since most of Denis' enemies belonged to the Faculté, this decision was in fact the death knell of further blood transfusion in France. Ten years later, the French Parliament passed an edict prohibiting blood transfusion on human beings. In time, the procedure was also abolished by the Royal Society in England; and these actions so impressed the magistrates of Rome that they, too, forbade the operation.

In the face of such powerful opposition, the interest in blood transfusion waned, and the procedure was virtually abandoned for nearly a hundred and fifty years. The idea, however, could not be completely destroyed, and several timid attempts at transfusion occurred during this period of quiescence. On November 23, 1667, before the disastrous fourth transfusion of Denis, Lower and King[22] had successfully introduced sheep's blood into the veins of a human volunteer. In 1683, in Germany, Kaufmann and Putmann,[23] by transfusing lamb's blood, cured a case of leprosy, but failed to cure two scorbutic soldiers and a fisherwoman suffering from a "devouring eruption." Riva and Manfredi, in Italy, transfused two human beings with sheep's blood[7]; and Nuck, in 1714, and Cantwell, in 1749, recommended the procedure for severe hemorrhage and extreme emergencies.[1]

Furthermore, in 1792, several transfusions were performed at Cambridge by Harwood; and, in the same year, Russel of Suffolk is said to have cured, by means of transfusion, a boy suffering of hydrophobia. In 1796, Erasmus Darwin, the grandfather of the illustrious Charles, advocated blood transfusion for carcinoma of the esophagus and other diseases in which nutrition was inadequate.[7] Finally, in 1802, Paul Scheel,[24] of Copenhagen, was so convinced of the value of the procedure that he published a valuable monograph on the subject, containing a careful review of all the previous contributions to infusion and transfusion.

Nevertheless, these references were few in number, so that the study of blood transfusion was actually dormant from 1683 to 1818. Meanwhile, other medical sciences were making leaps and bounds. Anatomy and histology had almost reached full growth. The dangers of embolism and the results of the entrance of air into the blood vessels were finally recognized; and experiments on blood coagulation were also begun. Finally, Leewenhoek (1632-1723) discovered his "animalcules" and developed his lenses; by 1818, the science of bacteriology had been started. The stage was then set for blood transfusion to be resurrected. Before going into this, however, we must consider a very important contribution that was made during this period of quiescence. In 1783, Professor Rosa of Moderna, working under the direction of Scarpa, found that the blood vessels were able to adapt themselves to increased blood volumes. Thus, the preliminary venesections, which had always preceded blood transfusions and which had hitherto been considered absolutely essential, were proved unnecessary.[1]

The revival of interest in blood transfusion occurred in 1818, when James Blundell, a London physiologist and obstetrician, published his series of papers on blood transfusion performed by his "impellor"—

an apparatus he had devised for this purpose.[25,28] In his practice, Blundell had often witnessed severe, fatal postpartal hemorrhage, and he had felt the crying need for some way to return blood to the bodies of his exsanguinated patients. In desperation, therefore, he sought to revive the technic of blood transfusion, which had been in disrepute for so long a time. He, himself, felt sure of the usefulness of the procedure, particularly in obstetrics. He believed that the suspicion and fear that surrounded the operation were due to a lack of understanding of its principles and its indications. Once these were soundly worked out, he hoped to use the operation successfully against postpartal hemorrhage.

Blundell began his work by performing numerous experiments in order to determine whether or not venous blood was as good for transfusion as arterial blood, and whether or not the properties of blood were changed by its passage through instruments. His first experiments were done with dogs and the time-honored cannula. He modified the old technic by cutting the cannula and allowing the donors blood to flow into a receptacle instead of into the recipient's vein. From this receptacle, he aspirated the donor's blood into a syringe and injected it through the other end of the cannula into the recipient's vein. By this method, he proved that venous blood could be safely substituted for arterial blood, and that blood was not vitiated by its passage through a syringe. He then modified the ordinary syringe with a three-way stopcock, attached to the receptacle at one end and to the cannula entering the recipient's veins at the other. The stopcock was so arranged that it could connect the syringe either to the receptacle or to the cannula, depending on the way in which it was turned. The apparatus worked successfully, when Blundell tried it on his experimental animals.

The apparatus, however, was cumbersome, and Blundell finally designed his "impellor," an instrument in which the syringe was built into the wall of the receptacle while the function of the original stopcock was carried out by a system of spring valves at the base of the receptacle. The "impellor" appealed to other physicians of Blundell's time, and, since it facilitated blood transfusion, it served to revive interest in the operation. With his instrument, Blundell transfused ten patients, five of whom died. His first four attempts were desperate measures on moribund patients, and they all failed. Later on, however, he successfully transfused three women, in whom death from postpartal hemorrhage was almost certain. Two later attempts (a case of leg amputation, and one of uterine hemorrhage) were successful. The last case (one of ruptured artery) failed.

The work of Blundell is most important because he placed transfusion on a sound clinical and scientific basis. In addition to his experiments that proved the usefulness of venous blood and his development of instruments which find their expression in the modern syringe and its modifications, he was one of the first to establish the principle that only blood of the same species should be used for transfusion. He proved that blood lost none of its life-giving properties by passing through instruments; that blood from *any* artery (or vein) was satisfactory; that blood should not be injected too quickly; that air should be excluded from the injecting apparatus; that the injection of up to 20 c.c. of air was not necessarily fatal; and that it was not only unnecessary but also undesirable to transfuse as much blood as had been lost. When Blundell's work was completed, he had added considerably to the facts known about blood physiology and blood transfusion; and he had performed more successful transfusions than any man before his time.

However, even Blundell's work could not successfully establish the widespread clinical use of blood transfusion. Four great obstacles still faced the proponents of this operation. These were agglutination and hemolysis which resulted from the admixture of incompatible bloods; infection which accompanied the lack of aseptic technic; and blood coagulation which made direct transfusion difficult and indirect transfusion im-

possible. Under these circumstances, transfusion reactions and death were not uncommon, and the operation was only used as a last resort. It was not until these dangers had been removed that blood transfusion began to be widely applied.

Coagulation was the first problem to be attacked. In 1821, Prevost and Dumas[1] had corroborated Blundell's findings that the blood used for transfusion had to be of the same species; they also had experimented with defibrinated blood and blood rendered incoagulable by caustic soda. Dieffenbach[29] had supplemented their findings when he showed, in 1826, that fibrin suspended in water and serum had no power to restore life in exsanguinated animals. Finally, Bishoff,[30] in 1835, successfully attempted the introduction of defibrinated blood into animals and showed that blood from animals of another species was toxic while defibrinated blood of the same species was well tolerated. He also concluded, from this experiment, that fibrin was a toxic element in the blood; and he recommended the use of defibrinated blood above all other types that were available for transfusion at that time. Finally, in 1847, Larsen, at the suggestion of Panum,[31] successfully used defibrinated blood in the first human transfusion of this kind; and, later, in 1873, Sir Thomas Smith employed defibrinated blood in the treatment of a case of melena neonatorum in St. Bartholomew's Hospital. The use of defibrinated blood began to spread and a hotly contested battle arose between the opponents and proponents of this type of blood. The work that had been done was vigorously corroborated and questioned, and the opponents of defibrinated blood made attempts to overcome coagulation by the addition of various chemicals to blood; for example, sodium bicarbonate, sodium phosphate, or ammonia.[32,33]

Meanwhile, the application of transfusion was spreading. Fifty years after Blundell's work, in 1859, Edward Martin[34] collected 57 cases of transfusion in postpartal bleeding, with 45 recoveries and 12 fatalities. The fatalities were blamed on the introduction of air into the veins, although it is more likely what they were due to the use of incompatible blood. Ten years later, over 155 cases of blood transfusion had been collected[1]; and, finally, Landois,[35] in 1875, reviewed the literature and reported 374 cases of human-to-human and 129 cases of animal-to-human blood transfusions.

Concomitantly, significant studies were being made by Magendie and Brown-Sequard, Jacob-Mueller, Panum, and Landois[1] on the physiology of blood; on the febrile reactions following transfusion; and on the fate of heterologous corpuscles. In 1869, Creite[7] described the clumping of human red blood cells whenever they were placed in sera of other species. Landois, in 1875, then found that this agglutination and hemolysis reaction always occurred whenever bloods of heterologous species were mixed with each other. He thus first satisfactorily explained the hemoglobinuria that followed heterologous transfusions.

By 1875, the indications and rationale for blood transfusion were remarkably well understood, and Chadwick[36] classified the known methods of blood transfusion into four groups: (1) transfusion with defibrinated blood; (2) mediate transfusion with pure blood; (3) immediate transfusion from vein to vein; and (4) immediate transfusion from artery to vein. With this as a beginning, the indications were expanded until they included treatment for carbon monoxide poisoning, poisonings of other types, sepsis, and leukemia, as well as hemorrhage and severe inanition.

Meanwhile, in America, where little work had been done before Blundell's time, scientists were stimulated by, and kept pace with the developments in Europe during the nineteenth century. It is difficult to determine when the first transfusion was done in this country. Channing,[37] Jackson,[38] Benedict,[39] and Rouanet[40] were some of the earliest American proponents and discussors of blood transfusion. Benedict,[39] in 1853, in New Orleans, presented a report of a committee investigating this subject and stated that "they were not aware of the operation ever having been performed in America up to that time." However, the

Philadelphia Journal of Medical Sciences, in 1825, while commenting on the work of Blundell, tells of a similar transfusion experiment done by Dr. Physic in America some 30 years before.[41] In addition, Jones,[42] in 1833, reported the use of blood transfusion in a fifty-year-old female with "tuberculous disease of the lung." Finally, Flint,[43] in 1860-61, transfused a moribund patient in New Orleans; and Braman,[44] in 1867, described a case of excessive hemoptysis which was saved by a timely transfusion. Towards the last years of the nineteenth century, the list of transfusions performed in this country was growing rapidly, and the operation had definitely become established in the United States. Finally, in 1874, Barker[45] made a plea to the medical profession not to save the procedure as a last resort, but to use it early, before the patient had lapsed into extremis.

During the last quarter of the nineteenth century, the operation gained favor throughout most of the scientific world; and it should have remained without prejudice up to the present day. However, the growing interest in blood transfusion also created an exaggerated enthusiasm among the proponents of the operation, and many of the facts and principles that had become established during the preceding centuries were disregarded. The indications were expanded until they included such fantastic maladies as "the burnt, the uremic, the syphilitic and the mad"—and, once again, claims of cures were made without the backing of scientific proof. At the same time, the difficulty of obtaining human donors caused many physicians[46,47] to revert to the use of animal blood*—with consequent severe transfusion reactions and fatalities. Some workers[48,49]even went so far as to suggest the use of other animal fluids (for example, milk) in place of blood, saying that "this operation will, in a few years, have superseded the transfusion of blood."[50] Fortunately, this latter suggestion died a quick natural death, but not before several fatalities had occurred. All of these events caused the operation to fall again into disrepute; once more, it was regarded with fear and suspicion and was reserved for use only as a last resort. In addition, it was just about this time that physiologic saline was developed, and its efficacy led to the virtual abandonment of blood transfusion until the beginning of the next century.

Incidentally, during the nineteenth century, especially during the latter half, bacteriology and immunology continued to develop, almost without any relation to the development of blood transfusion. However, the development of these sciences made an important contribution to blood transfusion. With the increasing knowledge about microorganisms and septic processes, there followed the development and the use of aseptic technic; this finally automatically eliminated one of the biggest dangers in blood transfusion—the introduction of infection into the blood stream of either the donor or the recipient. At the same time, as more became known about the etiology and pathogenesis of infectious diseases, it became obvious that many diseases had the causative organisms in the blood. Methods of detecting these organisms (or their products) were to be developed, in order to forestall the transfusion of infected blood into non-infected individuals.

* * *

The beginning of the twentieth century found the proponents of blood transfusion still perplexed with the problem of agglutination and hemolysis resulting from the admixture of heterologous bloods. The problem had first been encountered during the transfusion of animal blood into human beings. It had been made even more acute, however, by the discovery that human bloods were sometimes incompatible, transfusion reactions occurring much too often, in spite of the use of human donors. A hint as to the nature of these transfusion reactions came in the field of immunology, when Bordet,[51] in 1865, discovered that the introduction of non-species-specific red blood corpuscles into the blood stream

*Gesselius, in Russia, and Hasse, in Germany, first revived the use of lamb's blood. They blamed their severe reactions on "acute plethora."

would result in the formation of hemolytic antibodies in the serum of the recipient. Ehrlich and Morgenroth[52] later proved the specificity of these agglutinins and hemolysins for the particular type of foreign corpuscles that were introduced.

Then, in 1900, probably the most important single contribution to the development of blood transfusion was made, when Landsteiner[53] and Shattuck[54] both independently demonstrated the presence of isoagglutinating antibodies and isoagglutinable corpuscles in human blood. The following year, Landsteiner[55] described three blood groups, with respect to their agglutinating reactions, and discussed their practical significance. In 1902, a fourth group was added by De Costello and Sturli.[56] Finally, in 1907, Jansky[57] worked out the reciprocal agglutination reactions of all four groups and classified them accordingly. Unfortunately, however, his publication was in the Bohemian language and was relatively inaccessible. Three years later, Moss,[58] working independently and unaware of the Bohemian publication, confirmed Jansky's findings, but inadvertently transposed groups I and IV of Jansky's classification. Moss's work gained widespread recognition; and, when Jansky's work finally became known, the unfortunate transposition of groups I and IV created a great deal of confusion. Finally, in 1921, a committee of the American Medical Association[59] reviewed the question and recommended that, in view of the three years' priority, the Jansky classification be adopted. This recommendation, however, failed to clear up the confusion, since the use of the Moss classification persisted. Today, the question is being settled by the adoption of the Landsteiner groupings (A, B, AB, and 0). This is of distinct advantage because the nomenclature wording is based on the types of isoagglutinogens present; this fact makes the reactions of each particular group easy to remember.

The work of Landseiner and the men who followed him eliminated one of the greatest obstacles to the widespread clinical application of blood transfusion that its proponents had had to face. Therefore, the discovery of isoagglutination created a great furor in the scientific world; and, even as the Landsteiner theory was being developed, workers began to emphasize the significance of blood grouping in the performance of blood transfusion.[60] Finally, in 1908, Ottenberg[61-63] and his associates developed and applied technics for the clinical determination of blood groups. Since then, their technics have been improved, and they are now an indispensable part of the blood transfusion operation, as we know it today.

* * *

With the elimination of the dangers of agglutination and hemolysis, attention was once more focused on the still unsolved problem of the coagulation of blood, which had plagued the proponents of blood transfusion since the beginning of the history of the operation. Bishoff,[64] in 1835, had made a forward step in the solution of the problem, when he described and recommended the use of defibrinated blood. However, this had been found to be awkward and dangerous; fatalities were reported, and the technic soon lost its popularity.* Therefore, after 1900, attempts were made to utilize whole blood either by: (a) the prevention of the coagulation of blood by physiologic methods; or (b) the rapid transfer of blood before coagulation could occur; or (c) the addition of anticoagulants to the blood as it was withdrawn from the donor.

THE PREVENTION OF COAGULATION BY PHYSIOLOGIC METHODS

Carrel,[67] in 1905, ushered in the use of physiologic methods with the development of a method of suturing the artery of the donor to the vein of the recipient. The fact that blood did not clot so long as it remained in contact with intima alone was thoroughly appreciated at that time; and Carrel attempted to prevent the blood from contacting anything but intima, by his arterio-

*(a) Some attempts have been made to restore this technic, but they have not been successful[65,66] (b) Koehler, in 1877, showed that defibrinated blood contained an excess of fibrin ferments which exerted a hemolytic action on the recipient cells and produced severe transfusion reactions.

venous anastomoses. This method of direct transfusion was successful and it was used for several years. However, considerable dexterity and surgical ability were required in order to anastomose the vessels properly. Because of this, Crile,[68] in 1907, developed a cannula which considerably simplified the intima to intima approximation. Crile's cannula consisted of a simple tube, through which the vein could be pulled then cuffed back and tied securely. The donor's artery could then be drawn over the cuffed part of the vein, thus establishing intimal continuity without the necessity of a suture anastomosis.

Crile's method was far superior to Carrel's technic, because it could be done by any surgeon; it did not require the delicate surgical skill necessary for vascular anastomosis. In addition, the thromboses which sometimes occurred at the suture lines of the anastomosed vessels in Carrel's method were avoided by Crile's technic. Therefore, the latter method and its modifications[69-72] became the accepted means of direct transfusion for many years.

Both the Crile and the Carrel methods, however, depended upon the direct anastomosis of the donor's artery to the recipient's vein. As such, they possessed certain disadvantages. They almost invariably required the sacrifice of an artery of the donor; and they did not permit the accurate measurement of the amount of blood administered. They allowed the contact of open wounds of the recipient and the donor, and thus permitted better transmission of infectious diseases from one person to the other. In addition, the anastomoses were so delicate that movements of the donor or the recipient often tore them open, necessitating the cessation of the operation until they could be repaired. Finally, embolism sometimes occurred, especially in the Carrel technic, leading to death, paralysis, or other embolic mishaps.

* * *

A partial answer to the above disadvantages was provided by Brewer and Legett,[73] in 1909, and Curtis and David,[74] in 1911. Some years before the work of these men, Freund,[75] and Bordet and Gengou[76] had discovered that paraffin or vaseline-coated vessels delay the coagulation of blood. Using this fact as a basis for their experiments, Brewer and Legett developed a paraffin-coated cannula which was used for direct transfusion. Later on, Curtis and David also applied the paraffin coating principle to develop a Y-shaped paraffin-coated tube, having outlets for the recipient and donor vessels at one end, and an opening for the attachment of a syringe at the other end. This apparatus not only separated the wound of the donor from that of the recipient, but also afforded a means of measuring the amount of blood transfused. It gained a measure of popularity, and formed the basis for the tube devised by Kimpton and Brown, two years later.

The original Kimpton-Brown tube[77] consisted of a glass cylinder, tapering out at its lower end into an S-shaped cannula and having a perpendicular tube at its side. By means of a pressure pump attached to the side tube, the pressure inside the tube could be varied from negative to positive values (simply by reversing the flow of air, into or out of the tube). Thus, blood could be withdrawn from the donor's veins via the S-shaped lower end, or injected into the recipient's veins via the same route, depending upon the pressure inside the apparatus. This tube became very popular, and its various modifications[78,79] are still in use today. It had (and still has) certain disadvantages, however. The tube and all its connections had to be accurately lined with paraffin; and its use required a certain amount of skill on the part of the operator and his assistants.

Incidentally, there has appeared relatively recently, in Germany, a phenol-formaldehyde condensation product called "Athrombit" with which blood can remain in contact for at least 30 minutes without coagulating.[79] This substance is a plastic, and it has been used to make apparatuses similar to those of Kimpton and Brown. These are supposed to serve the same purpose as the Kimpton-Brown tube, with the added advantage of not requiring paraffinization.

THE USE OF RAPID TRANSFER METHODS

Following the work of Crile and Carrel on direct transfusion, the rapid transfer of blood was developed. The earliest application of this principle occurred in 1913, when Lindeman[80,81] revised and improved the multiple syringe method, described by von Ziemssen in 1892.[82] Lindeman utilized cannulae pushed into the veins of both the donor and the recipient and kept closed by obturators. On removal of the obturators, large syringes could be attached to the respective cannulae, first to withdraw blood from the donor's vein, then to inject it into the recipient's vein. This procedure was tedious and required coordinated action by skilled operators, so that it never became popular. However, it is of historical importance because it led to the development of the syringe-valve method of blood transfusion.

The syringe-valve technic, the obvious next step from Lindeman's method, was introduced, in 1915, by Unger.[83*] The apparatus was strikingly similar to the instrument that been introduced by Blundell, in 1825. Like Blundell's instrument, it consisted basically of a movable stopcock which could be rotated so that the vascular systems of the donor and the recipient could be alternately connected with a blood-pumping syringe. However, the stopcock devised by Unger provided the added feature of the reciprocal connection of the two vascular systems with a syringe containing saline. By this arrangement, the vessel, from which blood was not being withdrawn at that particular time, could be kept open by saline infusion. This was an important advance in blood transfusion, and numerous modifications of Unger's syringe-valve technic have appeared to this day.[84-87]

THE USE OF ANTICOAGULANTS

By far, the most important method of avoiding the coagulation of blood was the addition of anticoagulants. The first attempt in this direction was the suggestion and use of sodium phosphate, in 1869, by Braxton Hicks.[88] This was soon discarded, however, because of its harmful systemic effects. Later on, in 1892, Landois[89] suggested the use of hirudinin as an anticoagulant. His suggestion was followed by Satterlee and Hooker,[90] in 1914, but, as in the case of sodium phosphate, it was found that the amount of hirudinin required for the prevention of coagulation produced severe toxemia. Since then, other chemicals have been suggested and used—for example, sodium iodide,[91] arsphenamine,[92] and heparin.[93,94] All of them showed some important disadvantage.

The use of heparin is interesting. The donor was given enough heparin intravenously to increase the coagulation time to 20 minutes, so that the transfer of blood from the donor to the recipient could be done without fear of coagulation. The obvious disadvantage of this technic, however, was the danger of prolonging the recipient's coagulation time, with subsequent danger of hemorrhage. The proponents of this method said that this did not occur. However, the technic, which is still being worked on today, has not yet been developed to the point of complete safety.

One of the most important forward steps in the use of anticoagulants was made by Hustin, in 1914, in Belgium, when he used sodium citrate and glucose to prevent the coagulation of blood.[95] On November 14, of the same year, sodium citrate was used alone for the same purpose by Agote,[96] in Buenos Aires. The following year, Lewisohn[97] and Weil,[98] working independently in the United States, determined the upper and lower limits of the dosage of sodium citrate, and developed a simple technic for the addition of citrate to the blood as it was being withdrawn from the donor.

It is not necessary to go into the work of these two men, for it withstood the test of time and it is used very widely today. The simplicity of their technic made it possible to transfuse blood without trained assistants and without excessive discomfort to the donor or the recipient. This placed blood transfusion at the disposal of the average physician; and, when citrated blood was adopted by the armies engaged in World

*Other early syringe-valve developments were those of Freund, Bernheim, Kush, Miller, and others.[1]

War I; the technic for the citration of blood was standardized and was distributed throughout the world.

* * *

The development of the use of citrated blood, and the increased demand for blood transfusion occasioned by World War I stimulated a tremendous amount of research on the problems of this operation. Soon, blood transfusion became a science with many branches, some of which made important contributions to other phases of medicine. Each branch has had its own long story, which cannot be fully told here. Only the origin and early development of the most important branches can be considered in this paper.

The more recent development of blood transfusion can be divided into four major movements:

(a) The development of extra sources of human blood, outside of living donors.

(b) The development of methods for storing blood for long periods of time. The story of the Blood Bank.

(c) The development of blood substitutes and blood derivatives.

(d) The study of blood and blood physiology for its application in medical diagnosis and treatment.

THE DEVELOPMENT OF EXTRA SOURCES OF HUMAN BLOOD

The difficulty of obtaining donors, and, later, the frequency of transfusion reactions which followed the use of citrated blood prompted the search for extra sources of blood. The first difficulty was gradually overcome by education of the public; the second is still with us, although its seriousness has been decreased. The second difficulty was discovered by Beck[99] and others who showed that the incidence of reactions with citrated blood was almost three times as great as with unmodified blood. A great controversy arose over this problem, despite the fact that most of the reactions were mild—consisting of little more than chills and fever. An attempt was made to find the cause for these reactions; some of the explanations were:

(a) Prolonged exposure of the citrated substance to foreign substancea.[100]

(b) Deleterious effects of citrate on the platelets.[101]

(c) Reduction (by the citrate) of the phagocytic and opsonic index of blood.[102]

(d) The increase (by the citrate) of the fragility of the red blood cells.[103]

(e) Certain biologic and chemical changes in the blood produced by the citrate.[104]

The proponents of the citrate method, however, blamed the reactions on the use of unclean apparatus and improperly distilled water.[105] This has been found to be true, through bitter experience; the powder used on rubber tubing is particularly active in producing reactions.[106] Nevertheless, even the proponents of the citrate method feel that citrated blood is unphysiological. Therefore sources of unmodified blood were sought.

Autotransfusion: The first attempt to find an extra source of blood was the use of autotransfusion, that is, the reintroduction into the patient's veins of his own blood, which has been lost into his serous cavities by internal hemorrhage. The procedure was first suggested by Highmore, in 1874,[107] but it was not actually attempted until 1914, when Thies[108] successfully revived three pulseless patients by autotransfusion of blood lost into the peritoneal cavity. The operation was enthusiastically accepted and the procedure was applied to injuries to the liver and spleen, to ruptured ectopic pregnancies, as well as to penetrating wounds of the thorax (bleeding from lungs and heart).[109] In time, however, fatalities following autotransfusion were reported, and the procedure has come to be used only in extreme emergencies, where blood donors are too few or not available.

Cadaver Blood: The next attempt to obtain blood from sources other than living human donors came out of Russia. It involved the use of cadaver blood. Shamov first suggested the procedure in 1927 and began animal experiments upon the prob-

lems involved.[110] Later, Yudin[111] first successfully administered cadaver blood into the veins of a nearly exsanguinated Muscovite engineer who had attempted to commit suicide by slashing his wrists. The attempt at the use of cadaver blood was successful, and Yudin introduced the procedure into his services at the Sklyfosovsky Institute, where he was in charge of the entire surgical and accident departments. By 1930, he was able to report seven cases, all successful, to the Fourth Congress of Ukranian Surgeons at Karkov.[109] In choosing the donors for cadaver blood, only those persons dying from coronary thrombosis, electrocution, cerebral hemorrhage, street accidents and other sudden catastrophes were used. Those dying from crushed limbs, intestinal wounds, severe cranial injuries, and drowning were not utilized. Before drawing the blood, a careful autopsy was done to eliminate any disease or malignancy. Then the blood was withdrawn from the superior and inferior vena cavae. About two to three liters of blood could be obtained from each cadaver. The blood was withdrawn within six hours after death; it was utilized within three weeks after its withdrawal. Skudina et al.[112] found that cadaver blood "disagulated" within one to one and a half hours after death and remained fluid; this fibrinolysis thus made the addition of citrate to cadaver blood unnecessary. Cadaver blood therefore became the nearest approach to unmodified non-coagulating blood that has yet been found. In addition, it is cheap, it can be kept for longer periods of time (because it contains no citrate), and it gives fewer reactions because it contains no foreign material. However, the procedure was not widely adopted because it is aesthetically unsuitable and not absolutely necessary.

Placental Blood: The third major attempt to obtain extra blood was the removal of blood from "afterbirths." This procedure was also originated in Russia. Buskin,[113] in 1936, at the Oncological Institute in Moscow, used this type of blood for massive transfusion in surgical patients. Later on, the procedure was adopted in the United States,[114] the blood being collected aseptically, tested, typed, and preserved in the same manner as blood from living donors. This method is not as great a source of blood as the cadaver technic; but it is more suitable, aesthetically speaking. In addition, the placental blood has certain advantages in its high hemoglobin and erythrocyte count and in its 20 to 30 per cent higher coagulating power.

THE HISTORY OF THE BLOOD BANK

One of the greatest forward steps in the recent history of blood transfusion has been the development of methods of preserving blood outside of the human body, in a state suitable for transfusion. The importance of this development cannot be overemphasized; for, properly used, it provides the doctor with a constant, dependable source of blood at all times.

This new field in blood transfusion was opened, in 1916, by the discovery of Rous and Turner[115] that red corpuscles could be kept alive for four weeks in a mixture of three volumes of blood, two volumes of aqueous solution of sodium citrate and five volumes of dextrose solution. Russia then contributed another preservative, composed of a solution of sodium and potassium chlorides, sodium citrate, and magnesium sulfate in distilled water;[116] but this formula was found to be less effective than that of Rous and Turner.[117]

Following the development of methods of preserving blood, attempts were made to establish permanent depots where blood could be stored until it was needed. With this underlying principle, a "banking" system of blood storage was gradually devised. The first experiments in the storage of blood were conducted, in 1936, at the Sklyfavosky Emergency Hospital, in Moscow, where the first blood bank was established.[118] The first mass application of preserved, stored blood was attempted during the Spanish Civil War, when a Barcelona blood bank sent blood to the front lines, utilizing some 9000 liters of blood.[119]

The first blood bank in the United States was established at the Cook County Hospital, in Chicago, in 1937.[120] The second was

located at the Philadelphia General Hospital, in 1937;[119] and the third appeared, in 1939, at King's County Hospital, in Brooklyn.[121] Since then, the movement has spread until today nearly all the large hospitals in the United States have adopted the blood bank.[122] Today, incidentally, the preservative that seems to be most favored is the ordinary isotonic sodium citrate-physiologic saline solution devised by Lewisohn[97] and Weil.[98] The blood is collected in sodium citrate and preserved by keeping it at a low temperature, ranging from 1° to 8° Centigrade (Av.=4°). Under these conditions, the blood has been found to be usable with maximum safety up to 10 days after its withdrawal; and, in dire need, its therapeutic usefulness could be extended to 30 days after its withdrawal.[109]

The management of the blood bank, as it has evolved through the years, is too lengthy to discuss in detail. Suffice it to say that the donor is chosen on the basis of age (18-45), sex (males preferred), general health, freedom from communicable diseases, and miscellaneous (must not have eaten within three hours before the blood is drawn, and must not have ingested alcohol within five hours before the blood is drawn). After a routine Wassermann examination, the blood is typed and "deposited" or stored under the name of the service from which it came. It may then be "requisitioned" by that service as needed.

Recently, new technics have been introduced into the above procedure. In order to prevent transfusion syphilis resulting from donors who are in the pre-serologic stage of the disease without visible lesions, it has been suggested that mapharsen be added to the blood before transfusion.[123] Other workers have found that the storage of blood for four days before transfusion will allow the *Treponema pallida* to deteriorate, thus eliminating the danger of transfusion syphilis.[124] Meanwhile, Novak[125] has found that sulfonamides, added to the blood, will prevent and control bacterial contamination.

The technic of the blood bank has been applied in this present World War II. The increased demand for blood has led to the establishment of mobile blood banks which function at the various battlefronts. The typing of all military personnel before they reach the battlefront makes it possible to give the wounded transfusion after a simple cross-matching test.

THE DEVELOPMENT OF BLOOD SUBSTITUTES AND DERIVATIVES

As more facts became known about blood chemistry and physiology, many workers attempted to develop blood substitutes and blood derivatives for use in cases in which whole blood was not available. The earliest attempts were made with saline infusion. However, this was found to be unsuitable because it has too transient an effect. In 1895, Starling emphasized the importance of osmotic pressure relationships in the maintenance of blood pressure.[1] Following this work, many attempts were made to substitute colloidal and crystalline solutions of high osmotic pressure for the less available whole blood. These included various salt solutions,[1,109,126] glucose solution, gelatin, gum acacia, isinglass, pectin, ascitic fluid, amino acid mixtures, hemoglobin-Ringer solution, red corpuscles suspended in saline, hemolyzed blood, and, finally, blood plasma and serum. With the exception of blood plasma and blood serum, the other substances have been of little use;* most of them have proved unsatisfactory for one reason or another. Amberson[127] discusses in detail some of these substitutes and derivatives and concludes that "there is no complete substitute for blood."

The studies on plasma and serum have been carried on for years. Over seventy years ago, perfusion experiments with these elements were done by many European investigators.[128-132] Then, in 1907, Gutherie and Pike[133] found that these substances were effective in the treatment of hemorrhage. These observations were confirmed, and, during World War I, the use of plasma was suggested by several workers.[134,135] The procedure was not extensively used, how-

*Some of the derivatives are useful in special instances; for example, suspended red corpuscles are useful in severe anemias; amino acid mixtures and glucose solutions are useful in restoring nutrition; and so on.

ever, until recently, when the usefulness of plasma in hemorrhage, shock, burns, and hypoproteinemia was definitely established.[136-140] Following these experiments, the story of plasma and serum is essentially one of the development of technics for withdrawing, storing, and administering these blood derivatives. The highlights of this story are the development of pooled and citrated plasma; and the discovery of the preservation of plasma and serum by drying and freezing.

One of the great controversies in this field revolved around the question, "Should plasma or serum be used?" The question is almost an academic one, however, since both elements are human colloidal protein blood derivatives. For practical purposes, they are interchangeable. Strumia prefers plasma because it does not result in as many transfusion reactions as serum.[141] Others, however, prefer serum because it does not contain citrate and because fibrin precipitates do not occur during storage of serum.[142] The argument may be summarized by saying that both of these derivatives are useful—especially in burns and shock. The preference for one over the other depends largely on the circumstances pertaining to collection and preparation of the derivatives. Plasma is generally preferred because: (a) it yields a greater bulk of material when treated by centrifugation; (b) it has fewer reactions, due not so much to the citrate as to protein sensitivity; and (c) it can be easily collected and prepared in conjunction with the present day conduct of the blood bank.

THE STUDY OF BLOOD FOR MEDICAL DIAGNOSIS AND TREATMENT

As blood transfusion developed, the most dramatic phase of its history unfolded; the facts which had been collected through the years began to be applied in the diagnosis and treatment of disease. This field is extremely wide and only the most striking episodes will be mentioned.

One of the marks of progress in the history of blood transfusion has been the gradual expansion of the indications for the operation, until today they include the following:[1,109]

I. Hemorrhage
  A. Traumatic
    1. Non-operative
    2. Operative
  B. Vasculo-erosive
    1. Consequent to local disease
  C. Hemorrhagic States
    1. Defective coagulating mechanism
      a. Hypoprothrombinemia
      b. Thrombocytopenia
      c. Hemophilia
      d. Fibrinogenopenia
    2. Vascular defect.
II. Peripheral Circulatory Failure (Shock).
III. Preoperative and Postoperative Therapy.
IV. Hypoproteinemia.
V. Blood Dyscrasias.
  A. Hemorrhagic States (see above).
  B. Anemias
    1. Anemia of blood loss.
    2. Increased erythrocyte destruction.
      a. Hereditary forms
      b. Acquired forms
    3. Defective blood formation
      a. Deficiency in essential factors
      b. Depression or destruction of erythrocyte-forming centers
  C. Leukemia and Leukopenia.
VI. Infections.
VII. Intoxications and poisonings.
VIII. Debility.

For the most part, ordinary whole blood will suffice, regardless of the disease. However, there have also been developed special transfusion technics which are useful in therapy. Some of these are:

Immunotransfusion: This refers to the transfusion of blood from a previously immunized donor, into a recipient who is suffering from the same disease. Two types of immunotransfusion have been developed: (a) specific, and (b) non-specific.

Specific immunotransfusion was recommended in 1914 by Hooker and Saterlee[143] who reported marked improvement with

this therapy in a case of *staphylococcus aureus* osteomyelitis and septicemia. Their work was confirmed by Wright[144] in 1919 and the procedure has since been used in numerous maladies. The use of convalescent serum has been found superior to the serum of patients inoculated with a specific vaccine. Such a serum has been useful in measles, septicemias, undulant fever, whooping cough, diphtheria, and pneumonia. Antiserum has also been used for prophylaxis against these diseases.

In 1923, Colebrook and Storer[145] found that hemo-bacterocidal power of blood could be increased by inoculating the prospective donor with staphylococcus, streptococcus, and *B. typhosus* vaccines. This serum then has an increase in non-specific antibodies or opsonins. Since this method of inoculation is simpler than the administration of specific vaccines, the procedure has received widespread attention—particularly in acute infections. The onset of chemotherapeutic agents has curtailed the use of this procedure somewhat, but it is still a potential therapeutic weapon.

Exsanguinotransfusion: This is the simultaneous withdrawal of the recipient's blood and its replacement by blood obtained from a healthy donor. The procedure was suggested as early as 1885 by Whittell[146] and was performed, in 1916, by Burmeister.[147] It is a useful procedure in acute poisonings of various types, serving to dilute and disperse the poison in the recipient's blood.

Reciprocal or Exchange Transfusion: This refers to the simultaneous, continuous introduction of equal amounts of blood from the donor to the recipient and from the recipient to the donor. This procedure was performed experimentally by Nyiri[148] in 1926. The work was extended by Thalhimre, Solandt and Best.[149,150] The procedure has been applied to patients with kidney damage, where the donor's kidneys could be used to decrease the urea levels in the recipient's blood, until the recipient's kidneys had recovered from a critical non-functioning state.

Studies in hemagglutination have led to the discovery of new blood agglutinins, in addition to those found at the beginning of the twentieth century. A study of post-transfusion hemolytic reactions has resulted in the concept of the Rh factor.[118] This has served to explain erythroblastosis and some of the heretofore unexplained transfusion reactions. It has opened a whole new field of research which is being exploited today.

Furthermore, Landsteiner and Levine have described agglutinogen factors M, N, anl P.[151,152] In addition, type A cells have been shown to be slightly different in individual cases, so that A^1 and A^2 agglutinogen factors have been discovered.[153-155] Allergic reactions following transfusions have been observed and investigated.[156-158] And the dangers of the "universal donor" have been established.[159,160] Finally the transmission of disease by transfusion has been virtually eliminated. Since the first reported cases of transfusion syphilis[161] and malaria[162] studies have been conducted on the detection of infectious agents in blood until, by today, this is no longer a menace.

In closing, one final point must be made. Today, our attention is primarily occupied by indirect transfusion, so much so that we are apt to forget that, not so many years ago, before citrate had been fully developed, direct transfusion was the only available practical form of blood transfusion. This form of transfusion has also been developing through the past few decades; and it has reached a high peak of clinical applicability. The history of its development begins in the early attempts at rapid direct transfusion already mentioned. Some of the more recent contributions to its development have been made here at Tulane University. DeBakey and Gillentine have developed the syringe sleeve-valve apparatus;[87] and one of the most popular methods of direct transfusion in use today is the continuous flow apparatus developed here, in 1937.[163]

AFTERWORD

The final chapter in blood transfusion has not yet been written. It is true that the operation has been developed to a point where it can be used clinically; but, in the course of its development, scientists have

uncovered not one but many new fields of scientific research. For every problem that has been solved, a hundred new ones have arisen to take its place; and the advances which can be and are being made relative to blood transfusion deal with practically every phase of modern medicine.

No one can predict how far this research will lead us. But the future is in good hands. The Spirit of Medicine which has worked patiently and obstinately through the centuries will continue to yield the fruits of its labors for the benefit of mankind.

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DOSAGE OF SULFADIAZINE IN PNEUMONIA

Because of its greater efficacy and lower toxicity, the consensus of opinion in the United States today is that sulfadiazine is the drug of choice in pneumococcal pneumonia. The usual dosage advocated is 4 or 5 gm. as an initial dose, followed by 1 gm. every four hours. The initial dose varies however from 2 to 7 gm. and a maintenance dose from 1 to 2 gm. every six hours has also been used.

In a study to establish the optimum dosage, Collen and Phillips* compared the results obtained in two series of patients in which all conditions were approximately similar except that one group received the usual doses of sulfadiazine, while the other received double the usual dose. It was realized that the series did not represent cases of equal severity, but the value of the statistics was of value in a general way in indicating success.

In the first group 618 patients with pneumococcal pneumonia were treated from September 1942 through August 1943. Most of these received 4 or 5 gm. of sulfadiazine orally as an initial dose; severely ill patients received an initial dose of 5 gm. of sodium sulfadiazine intravenously plus 2 gm. of sulfadiazine orally. Then 1 gm. of the drug was administered every 4 hours or 2 gm. every 6 hours. The average blood levels varied from 3 to 10 mg. of sulfadiazine per 100 c. c. The mortality in this group was 66 patients or 10.7 per cent.

In the second group of 748 patients treated from September 1943 through April 1944, the same adjuvant therapy and general therapeutics regime was employed. In this series, however, every moderately or severely ill patient received 5 gm. of sodium sulfadiazine intravenously and 5 gm. sulfadiazine orally as an initial dose. Then 4 gm. was given orally every six hours. Sulfa levels in this group ranged from 12 to 20 mg. per 100 c. c. The mortality in this group was 46 patients or 6.2 per cent.

This report showed a decrease of gross fatality rate by 40 per cent with no other change in therapy except doubling of the dose of sulfadiazine.

The 5 gm. of sodium sulfadiazine given intravenously initially was in 500 c. c. of sixth-molar sodium lactate solution (ph 7 to 7.2). Five grams of sodium bicarbonate was administered orally every six hours while sulfadiazine was given. This is thought to be very important in decreasing the frequency of crystalluria and hematuria.

The series in which the double dosage

*Collen, Morris F., and Phillips, Edward. Arch Int. Med. 75:22-30, 1945.

was employed showed besides the decreased mortality a decrease in the incidence of sterile pleural effusions from 5.2 to 2.7 per cent and a decrease in the average number of days in the hospital required for recovery. There was no greater incidence of drug toxicity with this double dosage. An analysis of both series showed no significant difference in the severity of the pneumonia, the only difference being the use of approximately twice the usual dose of sulfadiazine.

The author concludes that for severely ill adult patients with pneumococeal pneumonia sufficient sulfadiazine should be given to maintain blood levels of at least 15 mg. and an optimum level at at about 20 mg. per 100 c. c.

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TOXIC REACTIONS OF SALICYLATE THERAPY

Salicylates, especially aspirin or acetylsalicylic acid, are among the most commonly used drugs by both physicians and laymen. Henry Z. Sable* discusses the pharmacology and toxicity of the drug and remarks on the confusion concerning the amount of the drug that may be administered with safety. Many Canadian workers use 10 gm. or more daily, while many Americans think of 7 gm. a day as a large dose. He does not agree with the statement of Cecil that aspirin is better tolerated by some patients than sodium salicylate.

The toxic symptoms most commonly noted are nausea, vomiting, tinnitus and partial deafness. Increased respiration may occur with prolonged use of sodium salicylate. The basal metabolism is increased by 20 to 25 per cent. Renal damage may occur in intoxication but is said to be not permanent.

It is not thought that the salicylates have any effect on the underlying infectious agent in rheumatic fever nor on the immune responses.

Hypocoagulability of the blood is produced and hemorrhagic manifestations may occur with massive doses. The action is said to be similar but not as intense as that of dicumarol. Sodium bicarbonate is useful in decreasing the increased gastric acidity.

The lethal dose is said to be from 10 to 30 gm. at one dose. He reports only one death in 752 cases of attempted suicide using aspirin in doses from 5 to 95 gm.

*Sable, Henry Z., Canadian Medical Assoc. Journal, 55:153-158, 1945.

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SELECTION OF ANESTHETICS

It is well understood that the ideal anesthetic has not been found. Ideally, an anesthetic should accomplish its purpose with safety and be free of unpleasant aftereffects. So states George J. Tomas* is discussing the selection of anesthetics and listing the contraindications for the present-day anesthetics.

Ether is stated to be the most extensively used and the most reliable. Its use is contraindicated in acidosis, old age, cataract surgery, respiratory disturbances, atheromatous vessels, increased intracranial pressure and proximity of flame or cautery.

Chloroform is often used in obstetrics but has many contraindications, including diseases of the heart, liver and kidneys, diabetes, anemia and asthenia.

Vinethene may be used for short or light anesthesia by inhalation, when muscular relaxation is unimportant. Acidosis, old age, debility, liver disease, renal insufficiency and the presence of flame or cautery are all contraindications.

Ethyl chloride must be used with caution in short procedures in which muscular relaxation is not necessary. Its contraindications are the same as those for chloroform.

Nitrous oxide does not produce relaxation. Among the contraindications are advanced tuberculosis, heart disease, high metabolic rates, and muscular, athletic or alcoholic individuals.

Ethelyne is more valuable than nitrous oxide and produces better relaxation. It may be combined with oxygen and the only

*Thomas, George J., Indications and Contraindications for Various Anesthetics. Anest. & Analg. 24:113-118, 1945.

contraindication Thomas lists is flame or cautery about the head or neck.

Cyclopropane may be used with a high oxygen concentration and is a suitable anesthetic for chest surgery and other procedures. It has a marked irritating effect on the conduction mechanism of the heart. It is highly explosive unless mixed with helium. It should not be used with epinephrine hydrochloride and is contraindicated in the presence of cardiac disease and cardiac arrhythymias or with the use of flame or cautery about the head or neck.

Rectal anesthesia is unreliable, should not be used for general anesthesia and has several contraindications.

Intravenous pentothal sodium is rapid in action and requires the maintenance of an efficient air-way by a trained anesthetist.

Local analgesia has its usefulness. Idiosyncracies to epinephrine, procaine, cocaine or their derivations are contraindications, as well as inability of patient to cooperate.

Spinal analgesia has many contraindications in spite of its usefulness. These include cardiovascular disease, brain or cord tumor, syphilis, shock, phobias concerning spinal analgesia and others.

Caudal analgesia is useful for perineal, vaginal and rectal procedures.

Refrigeration analgesia reduces the mortality rate in amputations of the extremities, and the patients are comfortable postoperatively.

From this summary of Thomas it appears that ether, ethylene or a combination of ethylene-ether with oxygen is still the most satisfactory and safest anesthetic agent for general use. The choice of the anesthetic agent, however, involves a consideration of the condition of the patient by the internist or the surgeon, or both, and the opinion of the anesthetist and his familiarity and experience with the particular method.

ORGANIZATION SECTION

The Executive Committee dedicates this page to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

ABSTRACT OF MINUTES EXECUTIVE COMMITTEE AUGUST 25, 1945

The Secretary-Treasurer reported that the present membership of the State Society is 1,483 which is an increase of 22 members over the number at the same time last year.

Recommendation of the Budget and Finance Committee that surplus amount in the savings accounts of the Medical Defense and Indigent Physicians Funds be invested in government securities, was approved. It was also the opinion of the committee that surplus amount in the checking account of the general fund should be similarly invested, amount predicated on balance after expense of advertising campaign is met.

The Congressional Committee submitted a report containing opinion in regard to bills under consideration by Congress at this time. This report, with attached supplemental statement, and also copy of the report of the Committee on Maternal Welfare, submitted to the Executive Committee at this meeting, has been sent to each member of the Society.

The report of the Committee on Cancer contained two recommendations, one concerning appointment of an Executive Committee of the Women's Field Army, and the other in reference to expense of the committee. Upon action of the Executive Committee a special committee has been appointed by the President to consider these recommendations.

A very comprehensive report was submitted by the Committee on Postwar Planning and, in accordance with instructions of the Executive Committee, is printed immediately following these minutes.

The design for the Walter Reed Memorial medal has been completed, the chairman of the committee reported, and five medals have been presented to the doctors who have earned these awards. Special recognition was made of the fact that Dr. Matas prepared the drawings for this medal.

Reports of the following committees were received and filed: Journal, Mental Health, Public Policy and Legislation, and War Participation.

The committee confirmed action taken by mail concerning approval of a survey of hospitals in Louisiana as proposed by the Louisiana Hospital Association.

A communication in which a complaint was made concerning handling of examination of mental cases in the state was presented and motion was made and carried that an interpretation of Act 303, 1944 in reference to this subject be secured from the Attorney General.

A proposed premarital bill for introduction in the next legislature, which has been prepared by the Social Hygiene Association of New Orleans, was presented and was referred to the Committees on Public Policy and Legislation of the State Society and the Orleans Parish Society.

Discussion of the venereal disease clinic at Delgado Memorial in New Orleans, followed presentation of a letter received from the Director of the Louisiana State Board of Health on this subject. The Secretary was requested to communicate with the Director calling attention to the plan approved previously by the State Society and also to the fact that according to the agreement made this and other similar projects should be terminated at the earliest possible time after the war.

The Secretary was appointed as representative of the State Society to attend a meeting of the Northwestern State College, in accordance with an invitation received for such representation.

The subject of newspaper advertising in regard to opposition to the Wagner-Murray-Dingell Bill and similar legislation was discussed. It was the opinion of the committee that such a campaign should be undertaken and that details should be worked out by a special committee. The Councilors were asked to disseminate information to their local societies in regard to having representatives appear before lay organization to speak on such subjects.

A special committee was appointed to meet with Senator Ellender to discuss bills before Congress, when he was in New Orleans in August.

It was decided that the 1946 meeting of the House of Delegates and general body of the Society will be held on April 29, 30, and May 1. Place of meeting will be decided upon at a later date.

REPORT OF THE COMMITTEE ON POSTWAR PLANNING

August 25, 1945.

To the Executive Committee,
Louisiana State Medical Society.
Gentlemen:

The Committe on Postwar Planning of the Louisiana State Medical Society has been rather active since appointment of the committee by our President, Dr. Val H. Fuchs. A report was made in the New Orleans Medical and Surgical Journal, Vol. 97, No. 11, pages 512-514, May, 1945, which presented the actions of the committee up to this time, with some suggestions that were made. Since this time, the committee has contacted all parish societies throughout the state requesting that similar postwar committees, such as established in New Orleans, be appointed in all parish societies.

These committees should have their attention called to the plan as outlined by the Orleans Parish Medical Society, and follow their suggestions or make any improvements that they may so desire to fit each individual organization.

The Association of Commerce Postwar Planning Committee, as well as the President of the New Orleans Association of Building Owners and Managers, has been contacted here in New Orleans with the idea of trying to obtain more office space for the men who are returning. It seems to be one of the most serious problems of the re-

turning veterans. The other matter in which the veteran has been very much interested has been the question of refresher courses and courses in residencies in hospitals throughout the state. So far nothing concrete has been able to be obtained in regard to the residencies, renewal of internships, and the refresher courses. To quote from Dr. H. W. Kostmayer, the following is an excerpt from his letter of August 10 in regard to this matter:

"Postwar planning for continuation study by physicians returning from the war has become something of a nightmare to me. I find myself continually frustrated by a complete lack of knowledge of how many physicians will be released in a given month, and how many of these will desire short courses, longer courses, courses in Medicine, courses in Surgery, or courses in any of the branches of medical practice. It seems to me, therefore, that we can do nothing better than to make plans while we await applications from sufficient numbers to justify the establishment of formal courses."

An excellent review has been obtained from the Bureau of Government Research outlining the needs and conditions of the state in regard to medical locations, prewar conditions, and ideal conditions as suggested by the American Medical Association. This review is attached to this report for the approval of the Executive Committee. We believe that this report should be given more publicity either by being published in the Journal, or by being submitted to the various parish medical societies for their own information. Also, a copy should be placed in the hands of the secretary-treasurer of the State Society for the returning men, in order to obtain locations on their return.

It has been impossible for the committee to see that all these activities are represented in the Orleans Parish Medical Society were carried out throughout the state, since this would require a representative in each one of the parish societies. The committee does not consist of any but local representatives, and, therefore, it has had to depend on the cooperation of the parish societies to further carry out these plans. However, we believe that this should be a primary objective of the State Society for the next six months or more. We believe that these committees, if organized throughout the state, would become active and much good could be accomplished, and that any resentment of the returning veterans towards the men who were not in the Armed Forces could be lessened to a material degree. These men could be made to feel that they are more than welcome, and that the Society is more than glad to cooperate in giving them help in order to get them started again in their former activities.

Respectfully submitted,
E. L. Zander, M. D., Chairman,
Committee on Postwar Planning.

MEMORANDUM ON THE DISTRIBUTION OF PHYSICIANS BY PARISHES FOR THE STATE OF LOUISIANA IN 1944

On the basis of data collected by the Committee on Postwar Planning of the Louisiana Medical Society, the Bureau of Governmental Research, Inc., has drawn up this memorandum and the accompanying maps.* The data supplied by the Committee consists of the number of physicians in each of the parishes in 1944 and an estimated population figure for each parish for 1944. According to Dr. B. I. Burns** the commonly used standard for comparative studies is a ratio of physicians to population of 1:1,000.

Applying this standard to the data for 1944, Map I has been prepared showing graphically the percentage deficiency of physicians in each of the 64 parishes. It will be noted that this deficiency ranges from none for Orleans Parish to 90.9% in West Baton Rouge. More than half the parishes have a deficiency of greater than 50% (See Table I for detail by parishes).

*Maps attached to original report.

**Burns, B. I.: "The Distribution of Physicians in Louisiana with Special Reference to Those in Private Practice", The Southern Medical Journal, April, 1942, pp. 381-389.

TABLE I

DEFICIENCY OF PHYSICIANS BY PARISHES 1944 ON BASIS OF ONE PHYSICIAN PER 1000 POPULATION

Parish	Et. Pop. 1944	No. of Active Physicians	Ideal No. of Physicians	Deficit of Physicians	% Supply is of Ideal
Acadia	42,490	20	42	22	47.6
Allen	16,631	6	17	11	35.3
Ascension	18,951	11	19	8	57.9
Assumption	17,075	7	17	10	41.2
Avoyelles	34,822	11	35	24	31.4
Beauregard	16,492	5	16	11	31.3
Bienville	18,876	8	19	11	32.1
Bossier	29,914	6	30	24	20.0
Caddo	143,226	137	143	6	95.8
Calcasieu	85,609	50	86	36	58.1
Caldwell	10,145	6	10	4	60.0
Cameron	5,225	3	5	2	60.0
Catahoula	11,933	2	12	10	16.7
Claiborne	24,113	11	24	13	45.8
Concordia	12,909	5	13	8	38.4
DeSoto	24,609	7	25	18	28.0
East Baton Rouge	121,864	83	122	39	68.0
East Carroll	15,054	4	15	11	26.7
East Feliciana	11,852	4	12	8	33.3
Evangeline	30,800	8	31	23	25.8
Franklin	27,992	12	28	16	42.9
Grant	16,000	4	16	12	25.0
Iberia	35,156	12	35	23	34.3
Iberville	24,701	12	25	13	48.0
Jackson	14,149	7	14	7	50.0
Jefferson	72,198	12	72	60	16.7
Jeff Davis	23,733	8	24	16	33.3
Lafayette	44,047	22	44	22	50.0
Lafourche	36,402	15	36	21	41.7
LaSalle	12,697	7	13	6	53.8
Lincoln	19,818	11	20	9	55.0
Livingston	15,750	5	16	11	31.3
Madison	15,236	7	15	8	46.7
Morehouse	25,082	10	25	15	40.0
Natchitoches	35,444	16	35	19	45.7
Orleans	587,674	594	587	0	101.2
Ouachita	60,086	44	60	16	73.3
Plaquemines	10,872	5	11	6	45.4
Pointe Coupee	20,044	5	20	15	25.0
Rapides	99,199	54	99	45	54.5
Red River	12,866	6	13	7	46.2
Richland	24,524	11	25	14	44.0
Sabine	20,408	8	20	12	40.0
St. Bernard	8,052	2	8	6	25.0
St. Charles	12,028	4	12	8	33.3
St. Helena	7,774	2	8	6	25.0
St. James	14,487	5	14	9	35.7
St. John	13,449	5	13	8	38.5
St. Landry	69,805	22	70	48	31.4
St. Martin	23,709	6	24	18	25.0
St. Mary	34,451	13	34	21	38.2
St. Tammany	23,971	13	24	11	54.2
Tangipahoa	42,859	15	42	27	35.7
Tensas	12,685	3	13	10	23.1
Terrebonne	37,628	11	38	27	28.9
Union	17,964	7	17	10	41.2
Vermilion	42,390	12	42	30	28.6
Vernon	30,898	9	31	22	29.0
Washington	33,790	8	34	26	23.5
Webster	35,468	14	35	21	40.0
West Baton Rouge	10,674	1	11	10	9.1
West Carroll	16,298	8	16	8	50.0
West Feliciana	5,653	3	6	3	50.0
Winn	13,829	4	14	10	28.6

TABLE II

CHANGE BY PARISHES IN SUPPLY OF PHYSICIANS IN COMPARISON TO POPULATION FROM 1940 TO 1944

Parish	Est. Pop. 1944	Number of Physicians 1944	1944 Pop. Per Each Physician		% Increase in Pop. Per Physician
Acadia	42,490	20	2,124	1,775	19.7
Allen	16,631	6	2,772	1,754	58.0
Ascension	18,951	11	1,723	1,632	5.6
Assumption	17,075	7	2,439	2,060	18.4
Avoyelles	34,822	11	3,166	2,066	53.2
Beauregard	16,492	5	3,298	2,474	33.3
Bienville	18,876	8	2,360	1,841	28.2
Bossier	29,914	6	4,986	2,210	125.6
Caddo	143,226	137	1,045	939	11.3
Calcasieu	85,069	50	1,712	1,449	18.2
Caldwell	10,145	6	1,691	1,551	9.0
Cameron	5,225	3	1,742	1,801	—3.3
Catahoula	11,933	2	5,967	2,923	104.1
Claiborne	24,113	11	2,192	1,691	29.6
Concordia	12,909	5	2,582	2,080	24.1
DeSoto	24,600	7	3,516	1,988	76.9
East Baton Rouge	121,864	83	1,468	921	59.4
East Carroll	15,054	4	3,764	3,170	18.7
East Feliciana	11,852	4	2,963	2,109	40.5
Evangeline	30,800	8	3,850	2,772	38.9
Franklin	27,992	12	2,333	1,614	44.5
Grant	16,000	4	4,000	2,655	507.
Iberia	35,156	12	2,930	1,359	115.6
Iberville	24,701	12	2,058	1,980	3.9
Jackson	14,149	7	2,021	1,987	1.7
Jefferson	72,198	12	6,017	5,603	7.4
Jeff. Davis	23,733	8	2,967	2,199	34.9
Lafayette	44,047	22	2,002	1,292	55.0
Lafourche	36,402	15	2,427	1,930	25.8
LaSalle	12,697	7	1,814	913	98.7
Lincoln	19,818	11	1,802	1,549	16.3
Livingston	15,750	5	3,150	2,541	24.0
Madison	15,236	7	2,177	1,844	18.1
Morehouse	25,082	10	2,508	1,838	36.5
Natchitoches	35,444	16	2,215	1,952	13.5
Orleans	587,674	594	989	835	18.4
Ouachita	60,086	44	1,366	883	54.7
Plaquemines	10,872	5	2,174	1,366	59.2
Pointe Coupee	20,044	5	4,009	3,000	33.6
Rapides	99,199	54	1,837	1,078	70.4
Red River	12,866	6	2,144	1,985	8.0
Richland	24,524	11	2,229	2,402	—7.2
Sabine	20,408	8	2,551	1,737	46.9
St. Bernard	8,052	2	4,026	7,280	—44.7
St. Charles	12,028	4	3,007	1,760	70.9
St. Helena	7,774	2	3,887	4,721	—17.7
St. James	14,487	5	2,897	2,766	4.7
St. John	13,449	5	2,690	2,109	27.5
St. Landry	69,805	22	3,173	1,986	59.8
St. Martin	23,709	6	3,952	3,770	4.8
St. Mary	34,451	13	2,650	1,747	51.7
St. Tammany	23,971	13	1,844	1,312	40.5
Tangipahoa	42,859	15	2,857	1,486	92.3
Tensas	12,685	3	4,228	1,771	138.7
Terrebonne	37,628	11	3,421	2,760	23.9
Union	17,964	7	2,566	2,094	22.5
Vermilion	42,390	12	3,533	2,097	68.5
Vernon	30,898	9	3,433	2,127	61.4
Washington	33,790	8	4,224	2,152	96.3
Webster	35,468	14	2,533	1,463	73.1
West Baton Rouge	10,674	1	10,674	2,252	374.0
West Carroll	16,298	8	2,037	2,139	—4.8
West Feliciana	5,653	3	1,884	2,930	—35.7
Winn	13,829	4	3,457	2,820	22.6

Map II shows the number of additional physicians needed to bring each parish up to the standard of 1:1,000. Numerically, the greatest deficiencies are in Jefferson, St. Landry, and Rapides Parishes, each of which need 40 or more physicians. Details by parishes are shown in Column 4 of Table I.

Map III shows the percent increase in population per physician during the four years which have intervened since the Burns study in 1940. The greatest percentage increase has occurred in West Baton Rouge Parish. Other marked increases (100% or more) have been in Caddo, Iberia, Catahoula and Tensas Parishes. The significance of these figures lies in the fact that the medical services available to the average resident in these parishes has decreased appreciably during the period. A few parishes show improvement by this yardstick. For example, both West Feliciana and St. Bernard Parishes appear to be better serviced today than four years ago. Details by parishes are contained in Table II.

Due to the fact that rural and urban areas present different patterns each group is discussed separately below.

Urban Areas

Burns' study of the supply of physicians in 1940 showed that the urban areas were better supplied with physicians than the rural areas. It also showed that on the whole physicians were younger in the urban areas than in the rural areas. On this basis it might have been presumed that the urban areas would have lost a greater proportion of physicians to the armed service and that with the rapid increase of population that has gone on in these areas during the war period they would have experienced a marked shortage in physicians. The data for 1944, however, show that this has not happened in the degree which might have been expected and, further, that the picture is quite definitely not uniform for the whole state in this respect.

In the New Orleans, Lake Charles, Shreveport and Monroe areas there has been some decline in the number of physicians in proportion to the population, but this decline has not been very great. In the large area around Alexandria, however, the supply of physicians has by no means kept up with the increase in population and a very notable shortage of physicians is evident. In the Baton Rouge area the situation is about the same, but it does not cover as large a number of parishes as is true in the Alexandria area.

Rural Parishes

In the so-called rural parishes a distinction has to be made between those that are adjacent to large urban centers and those which are remote from urban centers. With the development of automobile and bus services there has been a marked tendency for rural people to go to cities for their medical services just as they have gone to cities increasingly to buy goods. Thus, some parishes such as Bossier and Jefferson showed a big deficiency in physicians, but probably are fairly adequately serviced by the physicians in Shreveport and New Orleans. The general situation of such parishes has been described in the section above in which we dealt with the various urban areas.

In those strictly rural parishes not closely connected to a city, the picture is very uneven. Most of them have a marked shortage of physicians and Burns' study of 1940 showed that most of the physicians in these rural parishes were quite old. It also showed that few new physicians had gone into these parishes for a number of years. It probably can be presumed that few, if any, additional physicians have gone into such parishes during the war period. At the same time the war situation and the shortage of physicians may have caused some of these old physicians to defer their retirement. Along with this, there has been a considerable amount of shifting of population in rural areas as a result of the heavy flow of rural workers to war time manufacturing centers. Therefore, the supply of physicians in these parishes has been largely a matter of a change in the population balanced against the rate of re-

tirement of the physicians who were there in 1940, and the change in population per physician in 1944 as compared with 1940 shows this to be a very irregular picture.

In some of the rural parishes there were fewer people per physician in 1944 than in 1940. In others, there were approximately twice as many people per physician in 1944 as in 1940. The shortage existing in 1940, the low rate of entrance of new physicians into these areas during the war, and the relatively advanced age of physicians in rural parishes even in 1940, all indicate that there will be a critical shortage in the next few years with the death or retirement of present physicians.

Report prepared by Bureau of Governmental Research, Inc., August 4, 1945.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

CALENDAR OF MEETINGS

October 15. Hotel Dieu Staff, 8 p. m.

October 16. Charity Hospital Medical Staff, 8 p. m.

October 17. The Orleans Society of X-Ray Technicians, 7:30 p. m.
Charity Hospital Staff, 8 p. m.

October 19. I. C. R. R. Hospital Staff, 12:30 p. m.

October 23. Baptist Hospital Staff, 8 p. m.

October 24. Clinico-pathologic Conference, Marine Hospital, 7:30 p. m.
Catholic Physicians' Guild, 8 p. m.
French Hospital Staff, 8 p. m.

October 25. Clinico-pathologic Conference, Touro Infirmary, 12:00 noon.
DePaul Sanitarium Staff, 8 p. m.

October 26. L. S. U. Faculty Club, 8 p. m.
New Orleans Hospital Dispensary for Women and Children Staff, 8 p. m.

November 5. Board of Directors, Orleans Parish Medical Society, 8 p. m.

November 6. Eye, Ear, Nose and Throat Staff, 8 p. m.

November 7. Clinico-pathologic Conference, Marine Hospital, 7:30 p. m.
Mercy Hospital Staff, 8 p. m.

November 8. Clinico - pathologic Conference, Touro Infirmary, 12:00 noon.

November 12. Scientific meeting, Orleans Parish Medical Society, 8 p. m.

November 14. Woman's Auxiliary, Orleans Club, 3 p. m.
Touro Infirmary Staff, 8 p. m.

November 18. I. C. R. R. Hospital Staff, 12:30 p. m.

NEWS ITEMS

On August 15, Dr. Paul G. Lacroix resigned as treasurer of the Society because of ill health. In accordance with the By-Laws of the Society, it is the duty of the president, with the approval of the Board of Directors, to fill all vacancies in the Board of Directors, except that of president-elect. At the recent meeting of the Board of Directors of the Society Dr. Boni J. DeLaureal was elected as treasurer.

Dr. Vincent J. Derbes was recently certified by the American Board of Internal Medicine as a specialist in internal medicine and allergy.

Comdr. John F. Oakley recently received the Navy and Marine Corps Medal for heroism in action against the enemy on Saipan and Tinian during which, on several occasions, he continued to operate in an unprotected surgery despite fire and air raid alerts, after ordering other patients removed to places of relative safety.

Dr. Carl H. Rabin has returned from military service, and is now actively engaged in the practice of medicine at 624 Maison Blanche Bldg.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of very month	Monroe

Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

STATE MEETING TO BE HELD IN APRIL 1946

At the meeting of the Executive Committee of the State Medical Society held Saturday, August 25, it was decided to hold the annual state meeting on April 29, 30, and May 1, the place of meeting to be decided upon later. The details of the Executive Committee meeting will be published next month.

SOUTHERN MEDICAL ASSOCIATION

The 1945 meeting of the Southern Medical Association will be held in Cincinnati, Ohio, November 12-15. Hotel reservations may be secured by communicating with Dr. Robert L. Biltz, Chairman of the Hotel Committee, 910 Dixie Terminal Building, Cincinnati 2, Ohio.

POSTGRADUATE COURSE IN ALLERGY

The American College of Allergists offers an intensive, practical course in allergy for 5½ days, November 5 to 10, inclusive, at Thorne Hall, Northwestern University, Superior and Lakeshore Drive, Chicago, Illinois. Men in the service will be admitted free of charge, and for others the registration fee is $100.

Inquiries should be addressed to the Secretary of the American College of Allergists, 401 La Salle Medical Building, Minneapolis 2, Minnesota.

SOUTHERN BAPTIST HOSPITAL

The regular meeting of the Clinical Staff of the Hospital was held on September 25. The program consisted of a case not reported entitled "Sudden Death in a Diabetic" presented by Dr. Davis Haughton. Dr. H. L. Kearney reported on a patient with a cyst of the maxilla. The last feature of the scientific program was the death report in which Dr. Philip M. Tiller, Jr., discussed a case of a patient who had died as result of coronary occlusion.

COMMITTEE ASSIGNMENTS OF LOUISIANA CONGRESSMEN

The Journal is in receipt of the Committee Assignments of the Louisiana Congressmen sent to it by the Council on Medical Service and Public Relations of the American Medical Association. This is published for the information of the members of the Louisiana State Medical Society.

Senators

JOHN H. OVERTON—Manufactures, Chairman; Appropriations, Commerce, Irrigation and Reclamation.

ALLEN J. ELLENDER—Claims, Chairman; Agriculture and Labor, Naval Affairs, Post Offices and Post Roads, Territories and Insular Affairs; Special: Study and Survey Problems of Small Business Enterprises.

Representatives

1. F. EDWARD HEBERT—District of Columbia, Naval Affairs.

2. PAUL H. MAHONEY—Ways and Means.

3. JAMES DOMENGEAUX—Elections No. 1, Chairman; Insular Affairs, Irrigation and Reclamation, Merchant Marine and Fisheries, World War Veterans' Legislation.

4. OVERTON BROOKS—Military Affairs; Select: Post-War Military Policy.

5. CHARLES E. McKENZIE—Post Office and Post Roads.

6. JAMES H. MORRISON—Civil Service, Invalid Pensions, Labor, Public Buildings and Grounds, Roads.

7. HENRY D. LARCADE, JR.—Education, Flood Control, Patents, Pensions, Rivers and Harbors, Territories.

8. A. LEONARD ALLEN—Census, Chairman; Elections No. 2, Flood Control, Immigration and Naturalization, Pensions, World War Veterans' Legislation.

SMITH HONORED

A testimonial dinner was given to Dr. Wilbur C. Smith at the Roosevelt Hotel on the evening of Thursday, September 6. The dinner was organized by Dr. Spencer B. McNair. Dr. Emmett Irwin acted as toastmaster and the following speakers lauded Dr. Smith and his taking over the duties of Dean of the Louisiana State University Medical School. These speakers were: Dr. W. B. Hatcher, President, Louisiana State University; Dr. Frank R. Gomila, Commissioner Public Safety; Mr. John Y. Fauntleroy, member of the Louisiana State University Board of Supervisors; Dr. Hiram W. Kostmayer, Dean of the Tulane University Medical School; Dr. Val H. Fuchs, President of the Louisiana State Medical Society; Dr. P. H. Jones, Jr., President of the Orleans Parish Medical Society, and Brother Peter, Catholic High School of Baton Rouge. The invocation was delivered by the Very Rev. Thomas J. Shields, S. J.

Dr. Smith responded in a short and clever speech in which he urged the cooperation of every one connected with the school.

COLONEL WALTER C. ROYALS, M. C., HONORED

A reception for Colonel Walter C. Royals and other members of the 24th General Hospital was held on Tuesday, September 25, at 5 p. m. There was a large attendance at the reception, including the members of the Board of Administrators, the Deans of the various schools of the University, faculty and staff of the School of Medicine, Senior medical students and friends of the doctors who have served in the Unit. Dr. Rudolph Matas, who organized Base Hospital #24 during World War I, was also present.

Colonel Royals has been commanding officer of the 24th General Hospital sponsored by Tulane University, which has been overseas for two years, spending some months in Africa and then being transferred to Italy. Last winter the Unit was awarded the Fifth Army Plaque. The citation accompanying the award, signed by Lt. Gen. Mark W. Clark, Fifth Army Group Commander, read as follows:

"This organization provided superior medical attention to thousands of Fifth Army troops. The 24th General Hospital maintained highest standards of professional treatment despite heavy emergency demands which were made repeatedly. The noteworthy accomplishments of this hospital reflect the high traditions of the Medical Corps of the United States Army."

President Harris introduced Colonel Royals, who then presented the citation and plaque to the University. They were officially accepted by Dr. Hiram W. Kostmayer, Dean of the School of Medicine, in the name of the faculty of the School of Medicine of Tulane University.

AMERICAN MEDICAL ASSOCIATION

A meeting of the House of Delegates of the A. M. A. will be held in Chicago at the Palmer House, December 3-6, 1945.

RELEASE OF DOCTORS FROM SERVICE

Demand swells from medical organizations, press, business, labor, Congress, from the doctors themselves in uniform and above all from thousands who anxiously await the return of their own family doctor, *for the release* of the greatest number possible of the *doctors in service.*

Very definite *official* word should be forthcoming soon from Army and Navy authorities as to *how many, how soon* and on *what basis* doctors are to be released. Newspapers report that 13,000 to 18,000 doctors now in the Army are to be out by the end of the year, and 30,000 by July 1, 1946. *That's really good news!*

MEDICAL SOCIETIES FACE TASK

Faced with problems increasing daily, almost hourly in number and importance, the Council on Medical Service and Public Relations appeals to each and every county medical society to do everything possible to *hold regular meetings* and maintain an *active organization* during the coming year.

It is hoped that those county societies which have been discontinued regular meetings during the war will return now to their regular pre-war schedule.

This will be *doubly difficult* in many cases due to the fact that individual physicians are so busy and so pressed for time. Despite the working hours faced by every physician in his private practice *each must sacrifice* a substantial part of his time and effort for medical organization work if the medical profession is to continue to lead in giving the American public the high standard of medical care in the future as in the past.

URGE RETURN OF QUESTIONNAIRE

Each of the 108,000 civilian physicians in the country has received a letter and a questionnaire from the *A. M. A. Bureau of Information.* It is most important that each individual doctor complete and return these questionnaires in order to bring current records at the A. M. A. Headquarters up to date and in order to obtain actual facts in regard to the *true distribution of medical care.* Lt. Col. Robert D. Bickel in charge of the Bureau of Information reports that early returns from the questionnaire have been coming in rapidly.

DOCTOR NEEDED

A doctor is needed in Iberia Parish to take over the practice of medicine in two industrial plants. Outside practice is permitted, with a basic salary of $385.00 per month for treating employees. There is free office space, fully equipped; also one nurse for an assistant, and a nice home furnished for $25.00 per month. Anyone interested should get in touch with the office of the Journal, 1430 Tulane Avenue, New Orleans 13.

PROFESSIONAL TRAINING PLANNED FOR ARMY DOCTORS

In order to provide qualified doctors for the peace time, Army plans have been formulated to interest Medical Corps officers who are serving for the duration of the war to apply for commission in the Regular Army, Major General Norman T. Kirk, Surgeon General of the Army, announced recently.

Among the more important attractions which will be offered Medical Corps officers who remain in the Army are the following:

1. The Regular Army Medical Corps officer will be assured a professional career offering broader possibilities in a larger field than the practice of the average civilian doctor affords.
2. The training and the assignments of Army

doctors will be arranged to aid the Army doctors in obtaining board certification for specialties from the recognized civilian specialty boards.

3. Graduate training will be continued with the establishment of Army fellowships, residencies and special courses.

In addition to the above attractions, which carry decided weight with any professional man, the Army affords security in its pension system, hospitalization care and other considerations not usually available in civilian practice, General Kirk said.

The plans under this policy call for the establishment of graduate training programs at Army Installations where the residencies will meet the requirements of specialty boards and arrangements will be made for accrediting by the appropriate specialty boards, Colonel Wergeland said. Another phase of the program includes the etsablishment of Army internships at selected Army general hospitals.

Plans outline a procedure for giving professional rehabilitation and specialized training to Regular Army Medical Corps officers who have been in administrative work during the war. These doctors who have not been able to engage in practice because of administrative responsibilities will serve as understudies with doctors who have been active in professional practice. This assignment will lead to continued professional service and eventually specialty board certification.

Medical Corps officers in the Regular Army will be kept in professional capacities without material interruption under this plan.

The advantages of a professional career in the Army will also be brought to the attention of medical students to interest them in an Army commission. Only those who stand scholastically in the upper third of their classes will be prevailed upon to consider the Army for a career.

Civilian physicians and former Organized Reserve Corps and AUS officers now on inactive duty status may submit Statement of Interest direct to the Adjutant General's Office.

DR. FRANCIS G. BLAKE AND DR. KENNETH F. MAXCY GET TYPHUS AWARD

The United States of America Typhus Commission Medal was awarded at the Office of The Surgeon General, Monday, September 10, to Dr. Francis G. Blake, Dean of Yale University School of Medicine, and Dr. Kenneth F. Maxcy, Professor of Epidemiology at Johns Hopkins School of Hygiene and Public Health, for "exceptionally meritorious service." Both Dr. Blake and Dr. Maxcy, in addition to their other duties, are consultants to the Secretary of War.

The awards were presented by Major General Norman T. Kirk, Surgeon General of the Army. The citation accompanying the award to Dr. Blake said in part: "Dr. Blake initiated and directed investigations of classical importance on the clinical features and prevention of scrub typhus. He made new contributions to the knowledge and control of a farm of typhus fever of great military and civilian importance. His wisdom, energy, and special competence assured the success of this mission and laid the basis for enduring benefits."

Dr. Maxcy was commended for "his observations made in the field under difficult campaign conditions, which clarified earlier knowledge of the conditions under which this disease occurs and added greatly to information about the special conditions which were making this disease a health hazard of paramount importance to American troops."

The Typhus Commission medal, which was authorized by President Roosevelt, is regarded as a high honor in this field of science. Only about thirty men have been awarded it to date.

SURGEON GENERAL ANNOUNCES NEW OFFICER RELEASE POLICY

A revised point system program which will return 13,000 physicians, 25,000 nurses, 3,500 dentists and an undetermined number of other Medical Department officers to civilian life by January 1, 1946, was announced September 14, 1945, by Major General Norman T. Kirk, The Surgeon General.

Under the plan those Medical Corps officers who have 80 points, are 48 years of age or have been in the Army since before Pearl Harbor will be released as surplus officers unless they are specialists in eye, ear, nose and throat work; plastic surgery, orthopedic surgery, neuropsychiatry or are laboratory technicians. These specialists will be released if they were called to active duty prior to January 1, 1941.

This is a drastic lowering of points below the previous plan which was based on an adjusted service score of 100 for non-scarce Medical Corps officers and 120 for those in scarce categories.

HONORARY DEGREE TO COLONEL JONES

Western Reserve University, Cleveland, Ohio, has conferred upon Colonel Harold W. Jones, Director of the Army Medical Library, the degree of Doctor of Laws on July 13, 1945. This degree is in recognition of the work Colonel Jones has done in developing the Library.

Colonel Jones, born at Cambridge, Massachusetts, attended the Massachusetts Institute of Technology from 1894 to 1897. He then entered Harvard Medical School from which he received his medical degree in 1901. He was an honor graduate from the Army Medical School in 1906, and was graduated from the Army Medical Field School in 1930.

LEGION OF MERIT

TO: Brigadier General Charles C. Hillman, United States Army, of Almyra, Arkansas. For

service from August, 1939, to August, 1944. As Chief of the Professional Service, Office of The Surgeon General, by his untiring effort and devotion to duty he was responsible for the development of this Service from a small pre-war division to a large, well-balanced organization. Under his direction, physical standards were set up for the war-time Army, and professional direction was given to the blood plasma program and many other technical procedures which have been highly successful in the war effort.

NEW LIBRARIAN FOR THE ARMY MEDICAL LIBRARY

Willis E. Wright assumed his new duties as Librarian of the Army Medical Library on July 1, 1945. He will be assisted by Miss M. Ruth MacDonald, formerly Head Cataloger of the Detroit Public Library, who is Head of the newly organized Catalog Division and her assistant, Miss Irene Jones. Scott Adams has been named as Chief of the Acquisition Division.

Authorization has been received for thirty-one additional staff members for the Library. This brings the total authorized personnel strength to 156 including six military and one hundred fifty civilian employees. Eighteen members of this total are at present assigned to the Cleveland Branch of the Library.

NEWS ITEM

Dr. James Watt, U. S. Quarantine Station, New Orleans, Louisiana, a major in the U. S. Public Health Service (Reg.), recently arrived in Chungking on a mission for the United Nations Relief & Rehabilitation Administration to work with a special Chinese emergency medical program. Dr. Watt was detailed to UNRRA by the Public Health Service in July of this year.

EXAMINATIONS AMERICAN BOARD OF OBSTETRICS AND GENECOLOGY

Office of the Secretary
1015 Highland Building, Pittsburgh (6), Penn.

The next written examination and review of case histories (Part I) for all candidates will be held in various cities of the United States and Canada on Saturday, February 2, 1946, at 2:00 P. M. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year. All applications must be in the office of the Secretary by November 1, 1945.

INFECTIOUS DISEASES IN LOUISIANA

The weekly morbidity report for the week ending July 28 listed 11 cases of pulmonary tuberculosis, which was the only disease with more than ten cases reported. There were reported three cases of diptheria, one in Caddo, one in Terrebonne and one in Washington Parish. Three cases of malaria, one in Jefferson, one in Tangipahoa and one in Vernon Parish were reported and one was reported which occurred out of the state. Three parishes, Lafayette, Orleans and W. Baton Rouge, each reported one case of meningococcus meningitis and one such case was reported from out of the state. Poliomyelitis cases occurred in Acadia and Caddo Parishes; one in the former and five in the latter. One case of scarlet fever was reported from Jefferson Parish; one case of typhoid fever from Jackson and Lincoln parishes; one case of whooping cough from Orleans and five cases of typhus fever were reported from four parishes in the state. The report for the week ending August 4 included report of venereal disease cases, showing 1768 cases of gonorrhea and 1374 cases of syphilis. There were 25 cases of chancroid reported and 16 cases of lymphapathia venereum. Other diseases reported in numbers greater than ten were as follows: 175 cases of pulmonary tuberculosis, 147 of unclassified pneumonia, 126 of cancer, 72 of malaria, 55 of septic sore throat, 39 of whooping cough, 35 of bacillary dysentery, 31 of rheumatic fever, 30 of pneumococcic pneumonia, 27 of granuloma inguinale, 23 each of measles and typhus fever, 21 of typhoid fever, 18 of scarlet fever, 17 of diptheria, and 13 of tuberculosis of other form than pulmonary. Of the 72 cases of malaria reported, 52 cases were contracted within the Continental United States, 10 outside of the Continental Unied States and place of contraction of 10 cases was not stated. Six meningococcus meningitis cases were reported; one in Assumption Parish and five in Orleans. St. James and Orleans Parish each reported one case of poliomyelitis and Caddo reported two cases of this disease. The report for the next week, ending August 11, listed 61 cases of pulmonary tuberculosis, 56 of influenza, 44 of malaria (27 within Continental United States and 17 outside), 35 of whooping cough, 12 of typhus fever, and 11 of unclassified pneumonia. There were two cases of poliomyelitis reported; one from Bossier and one from Madison Parish. The 35 cases of whooping cough which were reported occurred in St. James Parish. For the week which terminated August 18 the most frequently reported diseases included the following: 46 cases of pulmonary tuberculosis, 45 of malaria (36 within Continental United States, 7 outside and 2 where place of contraction was unknown), 27 of septic sore throat, 19 of typhus fever and 11 of unclassified pneumonia. Meningococcus meningitis was reported, one case each, by Jefferson and Orleans parishes. Two cases of poliomyelitis occurred in Bienville Parish, and Bossier, Caddo, St. Landry and St. Mary, each reported one. Thirty-nine cases of pulmonary tuberculosis were reported for the week ending August 25, as well as 18 of unclassified pneumonia,

16 each of influenza and typhus fever and 14 of malaria. Seven of the cases of malaria occurred within Continental United States, six outside and place of contraction of one was not stated. Rapides Parish reported one case of meningococcus and poliomyelitis was reported by Bienville, Caddo and Madison parishes; the first reporting two cases and the other parishes reporting one each.

HEALTH IN NEW ORLEANS

The Bureau of the Census, Department of Commerce, reported that for the week which closed August 11 there were listed 134 deaths in the City of New Orleans of which 80 were white, 54 colored and 12 under one year of age, divided equally between white and colored. There was a decrease in the number of deaths which occurred during the week which ended August 18, the report showing 74 deaths in the white population and 33 in the colored, making a total of 107. Fifteen of these deaths were children under one year of age; nine white and six colored. For the week ending August 25 there were 28 more deaths reported than for the previous week, 77 of which were white and 58 colored and 15 were under one year of age; four white and 11 colored. The total number of deaths reported for the week ending September 1 was 139, divided 97 white and 42 colored, including a total of 13 infants, 12 of whom were white children. The report for September 8 showed a still greater increase in number of deaths, 97 white and 49 colored, making a total of 146. Of this number 13 were white children under one year of age and 11 were negro children. There was a decrease of 26 deaths in the city during the week which ended September 15, a total of 120, with 80 occurring in the white population and 40 in the negro. Only three deaths were reported in children under one year of age; one white and two colored.

MONTHLY STATISTICAL REPORT AUGUST, 1945

Estimated Population as of July 1, 1944

White	391,000
Colored	169,000
Total	560,000
Total deaths, all causes	574
White	363
Colored	211
Resident deaths, all causes	574
White	289
Colored	167

DEATH RATES

(Per 1000 per annum for the month)

	All Deaths	Non-Residents excluded
White	11.1	08.9
Colored	14.9	11.8
Total	12.3	09.8

Total births recorded		1,282
White	833	
Colored	449	
Resident births		984
White	642	
Colored	342	

BIRTH RATES

(Per 1000 per annum for the month)

	All Births	Non-Residents excluded
White	25.6	19.7
Colored	31.3	24.3
Total	27.5	21.1

THE ABC OF PENICILLIN

While I (Sir Alexander Fleming) was in America I saw most of the laboratories which are producing penicillin on a vast scale. I have said laboratories but perhaps factories is a better word, for penicillin production has become a factory proposition, and it is perfectly extraordinary to see what has developed from a simple laboratory observation made here in London, an observation made with no more complicated appartus than can be found in any hospital's bacteriological laboratory.

Penicillin used to be made by growing the mold on the surface of fluid on milk bottles, and some of it is still so made. Dealing with thousands of bottles every day involved too much labor, so a method was devised for growing it in large tanks, and this is being adopted universally. The largest tank in use contains 15,000 gallons. It is difficult for the ordinary man to imagine just how big a 15,000 gallon tank is. By my arithmatic it is equal to the content of 90,000 whiskey bottles. But who in these days can imagine 90,000 whiskey bottles? (British Information Service).

WOMAN'S AUXILIARY

Following are the officers of the Woman's Auxiliary to the Louisiana State Medical Society for 1945-46:

Officers

President—Mrs. Paul G. Lacroix, 3132 State Street Drive, New Orleans.

President-elect—Mrs. Arthur Long, 1567 Steele Drive, Baton Rouge.

First Vice-President—Mrs. Carroll Gelbke, 44 Willow Drive, Gretna.

Second Vice-President—Mrs. O. B. Owens, 1931 Military Highway, Pineville.

Third Vice-President—Mrs. B. C. Garrett, 4700 Fairfield Ave., Shreveport.

Fourth Vice-President—Mrs. A. G. McHenry, 1810 Riverside Drive, Monroe.

Treasurer—Mrs. Richard Vincent—1441 Eleonore Street, New Orleans.

Recording Secretary—Mrs. Frank Jones, 810 Park Blvd., Baton Rouge.

Corresponding Secretary—Mrs. Willard Wirth, 402 Vincent Avenue, New Orleans.

Chairmen of Standing Committees

Archives—Mrs. Ansel Caine, 5301 St. Charles Avenue, New Orleans.

Bulletin—Mrs. Earl Clayton, Norco.

Cancer Control—Mrs. Herman B. Gessner, 119 Audubon Blvd., New Orleans.

Doctor's Day—Mrs. Geo. J. Taquino, 18 Fontainbleau Drive, New Orleans.

Finance—Mrs. Donovan C. Browne, 4920 St. Charles Ave., New Orleans.

Historian—Mrs. John S. Dunn, 8410 Pontchartrain Blvd., New Orleans.

Hygeia—Mrs. Leo. J. Kerne, Thibodaux.

Indigent Widow's Fund—Mrs. Aynaud Hebert, 2013 Napoleon Ave., New Orleans.

Legislation—Mrs. C. Grenes Cole, 4938 St. Charles Ave., New Orleans.

Organization—Mrs. Arthur Long, 1367 Steele Drive, Baton Rouge.

Parliamentarian—Mrs. A. A. Herold, 1116 Louisiana Ave., Shreveport.

Press and Publicity—Mrs. Roy Carl Young, Covington.

Printing—Mrs. Daniel J. Murphy, 127 South Solomon Street, New Orleans.

Program—Mrs. J. E. Heard, 512 McCormick Street, Shreveport.

Public Relations—Mrs. Rhodes Spedale, 701 Eden Street, Plaquemine.

Red Cross—Mrs. William Kohlmann, 1330 Eleonore Street, New Orleans.

Revision of By-Laws—Mrs. J. Kelly Stone, 72 Fontainbleau Drive, New Orleans.

War Participation—Mrs. Clarence Erickson, 423 Herndon Ave., Shreveport.

Councilors

First District—Mrs. Jules Myron Davidson, 100 Fontainbleau Drive, New Orleans.

Second District—Mrs. Roy B. Harrison, 2327 Napoleon Ave., New Orleans.

Third District—Mrs. Jules E. Dupuy, New Iberia.

Fourth District—Mrs. William J. Sandidge, 522 Stephenson Street, Shreveport.

Fifth District—Mrs. DeWitt T. Milam, 1704 Island Drive, Monroe.

Sixth District—Mrs. Marquis C. Wigington, Hammond.

Seventh District—Mrs. Olin Moss, 2011 Shell Beach Drive, Lake Charles.

Eighth District—Mrs. Hiram O. Barker, Horseshoe Drive, Alexandria.

Advisory Board

Dr. W. R. Metz, Chairman, New Orleans; Dr. King Rand, Alexandria; Dr. Rhodes Spedale, Plaquemine.

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BOOK REVIEWS

Pulmonary Tuberculosis in the Adult; Its Fundamental Aspects: By Max Pinner, M. D., Springfield, Ill. C. C. Thomas, 1945. pp. 579. Price, $7.50.

The author of this important and useful book states in his preface: "The primary aim of this book is not to impart knowledge but to create understanding, to form rational and consistent attitudes and approaches to the problem as a whole, to provide the basically necessary foundations on which, in my opinion, the practical work should proceed." This aim has been achieved in a brilliant synthesis of present day knowledge of the pathogenesis, pathology, bacteriology, pathologic physiology and epidemiology of pulmonary tuberculosis as applied in treating the patient and in controlling the disease. It is not a textbook or primarily a reference work but a book to read and to use in reevaluating methods. The discussions of incipient, asymptomatic pulmonary tuberculosis, tracheobronchitis, collapse therapy, medical treatment and results of treatment are excellent. The text is pervaded by the informed and healthy skepticism of the scientist. Although it represents, as admitted, the personal opinions of the author on some controversial subjects, the reader is provided with a possible corrective in the form of the unique bibliographic arrangement. The references both at the ends of the chapters and in the general bibliography are not only carefully selected from the medical literature of the whole civilized world between 1882 and 1945, but they are also accompanied by succinct reviews of the content of each book or article. This enables the reader to obtain a much wider view of the problems in tuberculosis than any text short of an encyclopedia could give. There are author and subject indices. The readability of the book is enhanced by a style of writing and a vocabulary far superior to that in the average medical work. The illustrations are excellent within the limitations of reproduction of any roentgenograms and furnish a correlation of roentgenologic and pathologic findings whenever possible. Occasional slips in the proof reading both in the text and in the spelling of proper names may perhaps be explained by war time difficulties in publishing. Dr. Pinner's book should be studied by everyone engaged in treating pulmonary tuberculosis and it can be read profitably by medical students, pathologists, pediatricians, thoracic surgeons, and those teaching or working in public health.

J. L. WILSON, *M. D.*

Penicillin and Other Antibiotic Agents: By Wallace E. Herrell. Philadelphia, W. B. Saunders Company, 1945. xv + 348 pp. Price, $5.00.

This book is a review of the present laboratory and clinical knowledge of penicillin by one of the pioneers in its use in this country. A history of the discovery and development of this substance is followed by extensive discussion of production methods. The chapter on physical and chemical properties is limited due to war time secrecy on advances concerning the chemical structure of the molecule. The antibacterial effects against many organisms in cultures, laboratory animals and patients are fully discussed. The absorption, distribution in the body, excretion and methods for determining the concentrations in solutions or body fluids are fully covered. The clinical sections on administration and effectiveness are well done.

The information on other antibiotic agents, such as tyrothricin, streptothricin, and streptomycin, is less complete due to the smaller amount of research published on these substances.

This book is comparable to the similar one recently written by Kolmer, "Penicillin Therapy" (Appleton Century Co., 1945) as to content and merit.

FOSTER N. MARTIN, JR.

Constitution and Disease: Applied Constitutional Pathology. By Julius Bauer, M. D. New York, Grune & Stratton, 1945, 2d ed. pp. x'v + 247, figs. 4. Price, $4.00.

The favorable reception accorded this work is evidenced by its appearance in a second edition so shortly following the first (1942) and by publication of Portuguese and Spanish translations (1943). Previous contributions by the author, extending through a period of some thirty years, have made him a familiar and respected figure in the area covered by this provocative little volume. By virtue of long and intimate association with constitutional medicine Dr. Bauer is exceptionally qualified as author of a book which aims "to familiarize the reader with the principles of 'constitutional thinking' at the patient's bedside." It is a sad comment on present-day teaching in medical schools that a volume of this character should have to be "considered as a supplement to the routine medical curriculum."

Dr. Bauer takes the position, as he has before, that the constitution of the individual is the sum total of the genetic, or inherited, traits alone. Most other students in the field define constitution more broadly, to apply to the resultant of both gentic and environmental factors. The latter would appear to be the more expedient working definition, inasmuch as difficulties so often arise in distinguishing the relative shares of inheritance and environment in the production of specific qualities of the individual. All this is merely a matter of definition, of course, for Dr. Bauer emphasizes the importance of various environmental factors on the reaction capacities of man to disease.

The main themes of the book are individualization of the patient, consideration of the individual as a totality with respect to both bodily and mental characteristics, and the genetic basis of biologic inferiority. The first chapter considers individual variability and conceptions of the normal and abnormal. There follow two chapters giving a general treatment of constitutional pathology, two of them an over-all survey and the other a presentation of instances of inferiority in specific organs and systems. Two chapters are devoted to the "integrative systems of individual constitution"—the endocrine glands and the nervous system. There is a chapter treating types of normal and abnormal constitution: endocrine types, the asthenic constitution, arthritism, and so on. Next follows a discussion of some diseases having chiefly constitutional etiology: diabetes mellitus, obesity, essential hypertension, several disorders of the hemopoietic system, peptic ulcer, cancer. The concluding chapter deals with treatment of constitutional disease. There is an extensive bibliography, arranged by chapters.

This book is a welcome addition to the literature on constitutional medicine. It will promote fruitful thinking in a still too neglected territory.

HAROLD CUMMINGS, PH.D.

Minor Surgery: Edited by Humphry Rolleston and Alan Moncrieff. New York, Philosophical Library, 1994. Pp. 174. Price, $5.00.

In this small book one may review in a very short time a large number of the most common problems encountered in practice. The concise discussions are unusually clear, and there is no needless repetition or unnecessary long quotation from the literature; each chapter is written by a different author and thus the text is very practical. An interesting contrast in British and American methods is seen, and some of the treatments given are not seen in American literature.

GENE FARTHING, M. D.

Endicrinology of Woman: By E. C. Hamblen, B. S., M. D., F. A. C. S. Springfield, Ill., Chas. C. Thomas Co., 1945. Pp. 571. Price, $10.50.

This is a new edition of Hamblen's excellent book, which previously appeared in 1939. It would be more correct to say that this is an entirely new book, since the author has completely changed his plan of presentation of material, has brought the material in the book up to date, and has greatly improved what was already an excellent book. The arrangement of the contents of this volume is far better than that of the previous one, and the material is more accessible to the reader, both in its

organization and in its indexing. This book has excellent and numerous illustrations and photomicrographs, which are very well chosen. One is particularly impressed by the valuable correlation of the ovarian and endometrial findings, which are illustrated side by side. Despite the highly technical nature of much of the material, his book is very readable and contains a tremendous amount of excellent, well selected and correlated data. The topography is excellent.

The subject matter is presented under five chief subdivisions. The first of these deals with the history, embryology, anomalies, anatomy, physiology, chemistry and interrelations of the various endocrine glands. This is a rather brief but adequate presentation.

The second section is devoted to applied endocrine physicology, and includes a discussion of the endocrine physilology of the fetus and newborn, childhood and adolescence. There is a very excellent review of the endocrine physilogy of menstruation of pregnancy, and of the climacteric. The material container herein is well organized and capably presented.

The third section is probably the most valuable one in the book, and brings together the many endocrine diagnostic methods, which one frequently seeks in vain, and finds only with much labor, in the literature. The various laboratory tests utilized in the diagnosis of endocrine problems are presented and discussed together with such clinical procedures, as endometrial biopsy and vaginal smear studies. The particular value of this chapter can only be realized when one has endeavored to track down a given method of laboratory determination in regard to endocrine assays of various types, and has realized the difficulty of obtaining the desired information in a convenient and readily obtainable form. Hamblen expresses some doubt as to the clinical value of the vaginal smear methods and studies. This is an opinion which is held by a large number of reputable men in the field, despite the constant use of this method by probably an equally large group of clinicians, who feel that it is of definite value. Vaginal smear studies have a very definite place in the endocriniologic workup of a patient, and this reviewer does not feel that they should be abandoned. It is probable that with future study and more correct interpretation and evaluation of the findings, rather than discarding the smear method, we will find that it is a method of considerable value and should be utilized more frequently rather than less so.

The fourth portion of the book deals with functional disorders of the endocrine gland, including some that are not related to the gynecologic field directly. This serves as an important review for the gynecologist, who tends to become too myopic, stressing the pelvic dysfunction and forgetting that he is dealing with an intergrated physiology of which the pelvic viscera are a mere portion. There is no doubt that the gynecologic endocrinologist must be increasingly aware of the interrelation of the endocrines, and of the part played by general body physiology in the maintenance of the normalcy of the gynecologic endocrine system.

The last section of the book deals with endocrinology applied to gynecologic diseases, and includes a discussion of the therapy of functional disorders. This section is particularly valuable since it includes much of the material which Hamblen and his co-workers have contributed so brilliantly to this field during the past few years. It would be impossible for any one endocrinologist to outline endocrine therapy in functioal disorders, which would meet with approval of all of the men in the field. Likewise it would be impossible to find an endocrinologist whose whole rationale of therapy in all types of functional disorders would meet with the approval of any one individual in the field. It is probably equally true, that every honest endocrinologist admits that much of the therapy which he prescribes does not meet with his own approval, but is being given empirically, with the idea of later critical clinical evaluation in mind. This reviewer fully cognizant of the foregoing must take issue with some of the statements of Hamblen in regard for dysmenorrhea. I feel that his chapter on dysmenorrhea is not as complete as it might be, and I am forced to take issue with his statement that "More diligent and meticulous examinations infrequently relates organic diseases to dysmenorrhea". While it is quite true that organic pathology does not as frequently produce dysmenorrhea as previous opinion would seem to indicate, it is still true that there is a large number of women who suffer more than pelvic discomfort, who suffer true pelvic pain, in association with organic disease, which when corrected mitigates or completely relieves the previous menstrual pain. Hamblen speaks rather harshly of surgery in primary or essential dysmenorrhea, and perhaps gives too much emphasis to the psychic factor in dysmenorrhea. While I am in agreement that the operations for retroverted and antiflexed uteri belong to a past generation in the general sense, one cannot make such generalization but must consider the individual patient; and there are undoubtedly instances and not infrequently so when the suspension of a completely retrodisplaced uterus relieves otherwise severe dysmenorrhea. We all agree that sympathetic surgery in dysmenorrhea is a desperate last resort which "cures" by eliminating pain without correcting its cause. A gynecologist who can report large series of sympathectomies is either having the dregs of others practice dropped into his lap, or has not adequately studied his patients. Despite these minor criticisms, however, the chapter on dysmenorrhea contains a fair summary of the current theories of

etiology of primary dysmenorrhea, and outlines the therapy more or less generally used, with I think, correct emphasis upon the chaotic state of therapy in this condition, and the relatively poor results obtained from most types of therapy. It condemns, but should condemn more strongly the indiscriminate use of harmonal therapy.

It is rather surprising that the condition of amenorrhea is not discussed more fully, nor is its treatment outlined.

The treatment of functional uterine bleeding will undoubtedly provoke considerable resentment by individuals whose theories include other methods of therapy than at of cylic sterol therapy, "and pituitary regulation." While Hamblen has had brilliant results with this method, these results have not been obtained universally by other workers in the field. This reviewer feels that the method of cylic sterol therapy is of definite value and yields beneficial results in a reasonably high percentage of correctly selected patients. But despite careful selection of patients and the utilization of the therapy in accord with the methods of Hamblen, as outlined, one does see failures. Other methods of therapy should have been discussed to make this particular section more complete. Some of the recent work on the interrelation of Vitamins and hormones might have been discussed here with some enhancement of this particular section.

Hamblen has strongly condemned the use of androgenic therapy in the female throughout the book, beginning in the preface and including remarks in the various sections. The treatment is termed as being unphysiologic and it is indeed contraphysiologic. This reviewer has felt as strongly as Hamblen, that every method employed in endocrine therapy in the female should be directed toward preserving or increasing the feminity of the individual rather than utilizing contraphysiologic methods, which include in their use potential virilistic effects. However, this is probably an extreme view, and more recently this reviewer has felt that there are definite indications for the cautious use of androgenic therapy in gynecology. It should always be used with the dangers of virilization well in wind, and prescribed within the range of relative safety. The patient under such therapy should always be warned of the possible untoward effects, and therapy should be stopped if any are noticed. While it is quite true that androgens are contraphysiologic, that factor per se should not flatly contraindicate their use. It if is possible to secure an effect desired with a contraphysiologic drug without damage to the individual to whom it is being given, it should be used. It is probable that the pendulum will swing back and forth in regard to this particular aspect of gynecological endocrine therapy, and as our knowledge of the field increases, a somewhat more rational view may be employed. It is probably incorrect at the present time to criticize either viewpoint, considering the current status of information.

When one writes a chapter on therapeusis in endocrinology, it would probably be wise to boldly write the date of publication across the top of each page, and remind the reader that within six months or three months or an indefinite period, after publication, the therapy may be dated and outmoded. Our knowledge advances and many of our concepts change with commendable rapidity. It is the fault of the reader rather than the writer if an outmoded therapy in endocrinology is condemned. When one reads a particular therapeutic measure, one should bear in mind the research both laboratory and clinical which may have ensued since publication. This chapter will probably "date" badly in a relatively short time, however, it is free of most of the gross errors and outmoded empirical therapy contained in publications on therapeusis in endocrinology. At the present time it stands as an excellent source of information on therapy in this particular specialty.

This book stands out as a very valuable and needed contribution, and is recommended unreservedly for those who would attempt endocrine therapy in gynecology.

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